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ABSTRACT

The rising prices of journals and serials--major information sources for academic and research communities--are explored in this work, which presents two contractor reports on the topic. These two reports are introduced by an overview and summary together with recommendations for further Association of Research Libraries (ARL) action, short statements that define the problem and its impacts, and relate ARL's current actions (i.e., the Serials Prices Project) to options for immediate and long-term actions. The first report, "A Study of Trends in Average Prices and Costs of Certain Serials over Time," from Economic Consulting Service, Inc., explores whether serials price increases are warranted, given the cost structure of the publishing industry. It concludes that subscriptions have increased more rapidly than production costs, with a price/cost differential of between 4.5% and 12.9%. In the second report, "Of Making Books There Is No End," Ann Okerson describes the serials crisis as threefold: (1) the consumer problem, i.e., libraries must learn to be vigilant consumers rather than passive archives of everything published; (2) the systemic problem caused by the workings of the publishing industry; and (3) the economist's view of the problem, i.e., serials as a "natural monopoly" product. For the two reports, figures and tables support key points. A summary of the problems and recommendations for ARL action conclude the publication. References are provided for the two reports and concluding section, and appended materials include ARL statistics on serials. (SD)

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Report of the ARL Serials Prices Project

A compilation of reports examining the serials prices problem including analyses from:

— The Association of Research Libraries "Overview and Summary"

— Membership Resolutions and Recommendations for Further Action"

— and two contractor reports: *A Study of Trends in Average Prices and Costs of Certain Serials over Time,* by Economic Consulting Services, Inc., March 1989, and *Of Making Many Books There Is No End: Report on Serials Prices,* by Ann Okerson, April 1989.

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Association of Research Libraries
Washington, DC

May 1989

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ASSOCIATION OF RESEARCH LIBRARIES

Association of Research Libraries' Project on Serials Prices

Overview and Summary

Research libraries and the scholars and researchers that rely upon them face a major crisis. The crisis is that the escalating prices of serials are eroding the purchasing power of the research library collections budget, resulting in a loss of information to the scholar and researcher. Even the largest libraries can no longer afford to maintain comprehensive research collections because the cost of purchasing scientific, technical, and medical (STM) research results published in journals has skyrocketed. Both the loss of information and ready-access to a comprehensive collection have a direct bearing on the creation of ideas, research and development, and the movement of these results into the marketplace. These factors, in turn, influence the ability of the U.S. and Canada to compete in a technologically-based world economy.

The rising prices of journals and serials, major sources of information for the academic and research communities, are a problem for libraries in a number of other ways as well. For example, the increased costs of maintaining scientific and technical serials collections have led to a serious degradation in libraries' ability to maintain their collections in the humanities and social sciences. Rising serials prices also limit the ability of research libraries to purchase materials in other formats, such as books and electronic databases.

The serials prices problem is not new--it has recurred throughout the twentieth century. During the last five years, however, it has spiralled out of control. One critical factor is that the publication of certain key STM serials is concentrated increasingly in the hands of a small group of publishers. More of the money spent on academic library subscriptions is going to fewer publishers and the cost of these serials is soaring. For example, one university found that 20% of the subscriptions account for 72% of the total serials budget. Three companies together consumed 43% of the increase in that university's serials expenditure for 1987. This is a recurring pattern among Association of Research Libraries (ARL) member institutions.

ARL ACTIONS. ARL initiated a Serials Prices Project in the spring of 1988 to determine a course of action regarding this crisis affecting research libraries' ability to serve the information needs of the scholarly community. The ARL Committee on Collection Development proposed a serials prices study; the ARL Board of Directors endorsed the concept; ARL members each agreed to commit a $200 special assessment to fund the work; and ARL staff coordinated the year-long effort. ARL commissioned two reports on the serials prices issue to identify factors contributing to the rising costs and to suggest possible remedies.

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A report by Economic Consulting Services, Inc. (ECS) concentrates on four large publishers: Elsevier (Netherlands), Pergamon (U.K.), Plenum (U.S.), and Springer-Verlag (West Germany). The report reviews price data against estimated publishers' costs from 1973 through 1987. The contractor report finds that from 1973-87, publishers' profits increased between 40% and 137%. The results indicate that cost increases do not justify the price increases paid by research libraries. A second report by Ann Okerson of Jerry Alper, Inc., provides an overview of the issue and recommends actions to the Association.

The reports were completed in April 1989 and the ARL membership reviewed them at the May 1989 membership meeting. The results of that review included the passage of resolutions for action and acceptance of three broad recommendations made by the ARL Committee on Collection Development. These recommendations were adopted unanimously by the ARL Board and stated that ARL should:

> lead efforts with external constituencies to communicate the nature of the problem and the actions needed to address the causes of it as well as to develop several library-oriented consumer advocate services.
>
> orchestrate actions to introduce greater competition to the commercial publishers. Suggested steps include advocating the transfer of publication research results from serials produced by commercial publishers to existing non-commercial channels and encouraging the creation of innovative non-profit alternatives to traditional commercial publishers.
>
> form a partnership with scholarly groups to better understand the explosion in research and knowledge and to manage the concomitant explosion in publishing.

Consideration of the Committee on Collection Development's recommendations by the membership led to the adoption of a resolution at this meeting expressing the members' willingness to provide additional financial support to the Association's efforts in this area.

BACKGROUND. The Okerson report's analysis of ARL member library statistics describes the problem, which is, in essence, that more money is being spent to acquire fewer materials resulting in less comprehensive collections. The average funding support to ARL libraries rose 234% from 1973 to 1987 (compared to a 182.5% rise in the U.S. CPI during the same period). Nonetheless, ARL libraries' average percent of expenditures devoted to materials rose from 29.2% to 33.1% with an accompanying shift in the percentage devoted to serials from 40.4% to 56.2%. During this same period, the average serials holdings of ARL libraries dropped from 32% of the estimated universe to 26.4%. According to data collected by ARL, in 1988 the median price of a purchased serial was $115.00--an increase of 32% since 1986.

While multiple causes contribute to the current crisis, several predominate. They include the following:

> *Publishers' Behavior.* The major problems are increases in prices well beyond apparent increases in selected publishers' costs; increases in the size of journals; and, the initiation of new journals--at least partly in response to increased research and specialization, but also in response to perceived market opportunities.

Some foreign publishers employ dual pricing schemes in which prices in American dollars have little relationship to the price in the country of origin's currency. Some publishers are unable to establish definite pricing and publication schedules, some issue surprise invoices for supplementary charges part way through the year, and some combine several issue numbers into one physical issue.

Exchange Rate Fluctuations. The reduced value of the U.S. dollar in the world market contributes to increased prices. However, various studies, including the one completed for ARL by ECS, indicate quite clearly that prices have risen well beyond what can be attributed to exchange rate fluctuations.

Growth in Volume of Published Research. The number of scientists has grown rapidly over the last thirty years and the journal article continues as a major indicator of a scientist's value, both in terms of career development and fund-raising ability. The increased importance of international scientific research also contributes to the increased volume of material published and required by North American scholars.

Competition for Promotion, Tenure, and Grants. Approximately 28% of American scientists work in academe and account for nearly 70% of U.S. authored scientific papers. The promotion and tenure review process demands that academic scientists publish regularly to ensure security and career development. Similarly, grants in support of research are heavily influenced by the publishing record of potential grantees. Some contend that, in certain cases, the major rationale for the scientific and technical journal is to provide outlets for authors rather than resources for readers.

Market Dominance. The STM journal market is dominated by a relatively small number of publishers, many of them profit-making. Many journals have a virtual monopoly in their subject area. Publishers count on scholars and researchers demanding that libraries maintain subscriptions to prestigious journals regardless of price. These factors contribute to larger journals, higher prices, and new titles in narrow, specialized fields.

Economics of Journal Publishing. Journal publishing involves high fixed (i.e., front-end) costs and low marginal costs for additional printings. The market (typically consisting largely of libraries) for many specialized titles is quite small, thus forcing the cost per subscription to remain high in order for the journal to continue. This cost is carried by a few subscribers.

Key Role of Commercial Publishers. Scholarly journals were originally published by academics, scholars, and researchers, and their professional organizations, the scientific societies. Commercial publishers have now assumed a commanding position in the academic serials arena. The ARL-commissioned report from ECS indicates that annual rates of price increases for commercial publishers exceed estimated cost increases. Comparative studies of similar journals published by not-for-profit societies indicate considerably lower prices.

IMPACT OF THE SERIALS PRICES PROBLEM. The financial commitment needed to maintain serials subscriptions forces research libraries to reallocate available resources; cancel subscriptions; eliminate the purchase of new subscriptions; and, call for emergency funds from universities to maintain existing subscriptions.

Combined, these developments jeopardize scholarship and research in North America. Research is endangered because research library collections are less comprehensive; there is less direct access by the user to information; and, the large increases in the STM journal costs result in an inadvertent diminution of support for the humanities and social sciences.

OPTIONS FOR ACTIONS BY ARL. An effective strategy for alleviating the serials crisis--one that goes beyond prices to include a broader range of issues related to scholarly communication--will require the cooperation of research libraries, scholars, university administrators, and both commercial and not-for-profit publishers. Three broad options for action are presented in the Okerson report to ARL for consideration.

OPTIONS FOR IMMEDIATE ACTIONS. First, ARL should undertake an urgent set of actions to demonstrate the serious impact on scholarship of the serials prices problem. To do so requires the development of an ARL capability to lead the Association's efforts with the university, government, scholarly, and publishing communities. Possible activities are described on page 41 of the Okerson report and include:

Distributing the ARL-commissioned reports as widely as possible;

Providing information to libraries to assist them in making educated decisions regarding selection and deselection of serial titles;

Developing subject-specific cost indexes for critical serial titles with consideration of measuring relative value of titles;

Conducting ongoing programs of education and publicity, directed toward librarians, faculty, university administrators, professional societies, and politicians;

Identifying problem publishers and coordination of protest actions by the library community;

Consideration of resource-sharing arrangements, including further exploration of trade restraint and copyright issues.

OPTIONS FOR LONG-TERM EFFORTS. The second recommendation proposes a set of actions to transfer the publication of research results from serials published by commercial publishers to existing non-commercial channels. Among the proposed actions, beginning on page 42 of the Okerson report, are:

Convening a group of leading learned society publishers, university presses, and other potential credible non-commercial publishers with the intent of expanding their role in the publication of scholarly information;

Convening a group of university and granting agency representatives to explore making publication through a non-commercial channel the preferred means for reporting research results;

Presenting the ARL position to appropriate congressional committees for actions in furtherance of the national interest;

Considering means of providing support for the development of credible alternative(s) to traditional publications provided by commercial publishers.

The third recommendation proposes that ARL form a partnership with others in the scholarly community to examine the scholarly publishing process to better understand the explosion in research and knowledge and to manage the concomitant explosion in publishing. The suggested actions, found on page 45 of Okerson report, include:

Publishing and distributing arguments regarding the need to reform the technique for judging academic promotion and grants so as to eliminate undue pressure for excessive publication;

Presenting the problem to appropriate congressional committees, especially those involved in the funding of federal granting agencies.

This *Overview and Summary* was prepared by ARL staff. The following studies were funded through a special assessment of ARL membership and a grant from the Council on Library Resources:

1. Economic Consulting Services Inc. *A Study of Trends in Average Prices and Costs of Certain Serials over Time*. Washington, DC: Economic Consulting Services Inc., March 31, 1989.

2. Okerson, Ann. *Of Making Many Books There Is No End: Report of Serials Prices for the Association of Research Libraries*. Eastchester, NY: Ann Okerson, April 1989.

May 1989

SERIALS PRICES:
ARL Membership Resolutions and Recommendations for Further Actions

Resolutions

*The members of the Association of Research Libraries (ARL) are concerned that rapidly escalating prices of scientific, technical and medical journals, especially those commercially published, have eroded their ability to serve the interests of the scholarly community. Reports to ARL from an economic consulting firm and an independent consultant, confirm that the research libraries of North America face an immediate economic crisis which translates into a crisis for the United States' and Canada's efforts at competing effectively in the world's research and development arena. The members and the Association are prepared to launch a multi-faceted program aimed at mobilizing the scholarly, scientific, academic, publishing and research library communities and appropriate government bodies, to address this major issue.

Adopted by ARL Membership
May 11, 1989

*It is the sense of the membership that the issue of serials pricing is of such a critical nature that we would support a supplementary dues assessment in order to expedite Association action.

Adopted by ARL Membership
May 11, 1989

Recommendations for Further ARL Action

First, that ARL lead efforts with external constituencies to communicate the nature of the problem and the actions needed to address the causes of it as well as to develop several library-oriented consumer advocate services.

Second, that ARL orchestrate actions to introduce greater competition to the commercial publishers. Suggested steps include advocating the transfer of publication of research results from serials produced by commercial publishers to existing non-commercial channels and encouraging the creation of innovative non-profit alternatives to traditional commercial publishers.

Third, that ARL form a partnership with scholarly groups to examine the scholarly publishing process and to find ways to manage the explosion in research and knowledge and the concomitant explosion in publishing.

ARL should develop a program capability to direct these efforts. If necessary, unbudgeted 1989 funds may be expended to develop this capability.

Developed by ARL Committee on
Collection Development and endorsed by
the ARL Board, May 12, 1989

Board Actions

The Board of Directors acted on this mandate from membership, accepted the recommendations of the Collection Development Committee and authorized the following actions be initiated by ARL staff:

- publicize the results of the studies;
- initiate contacts with scholarly and higher education groups;
- prepare options for establishing a serials prices program capability at ARL;
- expend unbudgeted 1989 funds, if necessary, to advance the recommendations.

Adopted by the ARL Board, May 12, 1989

1538Q

ECS ECONOMIC CONSULTING SERVICES INC.

A STUDY OF TRENDS IN AVERAGE PRICES AND COSTS OF CERTAIN SERIALS OVER TIME

PREPARED FOR THE
ASSOCIATION OF RESEARCH LIBRARIES

This is a contractor report prepared for the Association of Research Libraries (ARL). The views expressed in this report are those of the contractor and do not necessarily reflect the views or positions of the ARL Board or those of the ARL Membership.

BY
ECONOMIC CONSULTING SERVICES INC.

MARCH 31, 1989

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A Study of Trends in Average Prices and Costs of Certain Serials Over Time

EXECUTIVE SUMMARY

At the request of the Association of Research Libraries (ARL), Economic Consulting Services Inc. (ECS) conducted an analysis of trends in average subscription prices and publication costs over time. The analysis focused on four major publishing firms based in the United Kingdom, the Netherlands, West Germany, and the United States. The objective of the study was to test the hypothesis that, after adjustment for fluctuations in exchange rates, subscription prices paid by U.S. libraries have risen at a rate greater than inflation in publishing costs, with the gap accruing to the publishers as incremental profit.

Our methodology involved a longer time period and a much larger sample of serials titles than had been analyzed previously. We developed a statistically valid sample of more than 100 titles for which we surveyed trends in average price per page for the period 1973-1987. We then "overlaid" this time series data with an estimated index of publishing costs. This cost index was based on a previously existing cost model for the publishing industry and extensive discussions with serials experts. The results of our analysis indicate that cost increases in the serials publishing industry simply do not justify the price increases that research libraries have had to face, notwithstanding fluctuations in exchange rates and the effect of inflation.

In our estimation, each targeted publisher has increased subscription prices for the sample of titles examined at a much faster rate than the rate at which their costs have increased. The range of the difference between the annual growth rates of price per page and costs is from 2.6 to 6.7 percentage points. If we restrict the analysis to the time period 1980-1987, then the range is from 4.5 to 12.9 percentage points.

The following example helps appreciate the impact on profits that this differential implies. Suppose the publishers were just breaking even in 1973, that is, their costs of publishing serials were equal to the prices which they were charging. Then assuming a price-cost growth rate differential as estimated, publisher profit ratios (the difference between price and cost divided by cost) in 1987 would be between 40% and 137%. Even if we use the shorter time period, the greater differential implies that a break-

even operation could grow to one with a 34% to 129% rate of profit.

If such estimated rates of growth are reasonably accurate, then the library community would benefit greatly from such measures as the encouragement of new entrants into the business of serials publishing, and the introduction of a program to stimulate greater competition among publishers by injecting a routine of competitive bidding for publishing contracts of titles whose ownership is not controlled by the publishers.

I. OVERVIEW

In May, 1988 Economic Consulting Services Inc. (ECS) was retained by the Association of Research Libraries (ARL) to perform an analysis of serials prices and costs over time. The goal was to determine whether or not recent price increases faced by research libraries are warranted given the cost structure of the publishing industry. This report contains the analysis and conclusion of our research.

The conclusion is straightforward. The subscription prices charged by publishers for serials have tended to increase much more rapidly than their costs of production. In fact, the analysis shows that the price-cost differential in annual rate of growth is in the range of 2.6 to 6.7 percentage points during the years 1973-1987. If the time period is restricted to 1980-1987, then the differential is in the range of 4.5 to 12.9 percentage points.

There were three different tracks which our analysis pursued. First, ECS reviewed the existing literature in this field. The review was conducted in order to avoid unnecessary duplication of effort and to identify gaps in the research conducted by others. Our summary of the literature is presented in Section II. The second and third paths of our analysis were in the cost and price area. Part A of Section III documents the cost research while Part B of the same section documents the price analysis. These two data series were overlaid in order to analyze the change in profits over time.

II. LITERATURE REVIEW

The literature on the serials pricing issue is extensive and not confined to the recent past. In 1933, a Library Journal review of an article in a German publication, Zentralblatt fuer Bibliothekswesen, stated that "American libraries, by their ability to pay, have enabled the (German) publishers to persist in charging exorbitant prices."1/ The names of the corporate players have changed, but the issue is the same. U.S. libraries believe they are paying unjustifiably high prices for serials and publishers believe they are receiving only a "just" price. This section of our study offers a brief review of the abundant literature available, and describes the contribution made by this study.

1/ Taken from Huibert Paul [17].

The existing literature reviewed by ECS can be classified into three different areas. One class focuses on a particular library's budgeting problem. Second, there are articles which provide a statistical analysis of price increases for journals within a particular field. Finally, there are articles which document and analyze the pricing policy of selected foreign publishers.[2] Interspersed among these strands of the literature, authors will often outline their view of the basic issues driving recent price increases.

As an example of the first class of literature, Stuart Grinnel [7] writes that Louisiana State University is concerned with highlighting the impact of the more expensive journals rather than simply analyzing average price trends. At LSU, analysis showed that 3.75% of their serials collection accounted for 22% of their serials budget. In addition, Hamaker [8] reports that one study done on a 1986/87 data set showed that 10.2% of total subscriptions for college and university libraries represented 48.3% of the total dollars billed by a particular subscription agency. Other studies include Lynden's [14] article for the Brown University faculty newsletter. He made observations regarding exchange rate trends, price increases of serials, and even higher price increases of scientific serials. Also made available to ECS were studies of serials holdings whose prices exceed $200 per year (Clemson University) and serials elimination program outlines (University of Montana, Texas A&M University, and the University of Western Ontario). These universities seem to be highlighting the most expensive journals in order to increase the library community's awareness of the magnitude of the budgeting problem.

In ECS' review of the literature, we also encountered studies that involved in-depth analyses of serials prices within a particular field. In the field of physics, Barschall [2] discusses a study in which the average price of physics journals is compared to the average price of humanities journals. The ratio is almost 7 to 1. He speculates why this price ratio is so large: 1) circulation;[3] and, 2) size of journal. Larger circulations imply lower unit costs and undergraduate institutions are more likely to

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2/ The pricing policy in question is typically one in which the publisher sets a domestic (publisher's country) price and a separate North American price, which is often much higher.

3/ Circulation, in this document, will refer to the number of copies of a particular serial that a publisher sells.

subscribe to humanities journals, factors that presumably permit publishers to charge relatively low prices for such journals. Regarding journal size, Barschall quotes a study which indicates that physics journals have twice as many pages annually as other science journals. He also discusses page charges imposed by publishers and indicates that they are probably no longer a significant cost issue.

Several other field-specific studies were made available to ECS. In the "Survey of American Research Journals" [20], the prices of mathematics journals in 1984 are analyzed. Journals were categorized into three types: primary typeset journals; primary journals published from author prepared copy; and translation journals. The supposition was that costs, and therefore prices, should vary according to these distinctions. The author relied on data indicating the number of pages per journal, and, from a sample of pages, estimated the number of characters per page. This study also provided the option for publishers to respond to the analysis. The author sent a followup questionnaire to the publishers to verify the page counts and subscription prices. In the study, average prices per character and ranges of price variation can be made by the reader according to the three types of journals.

Another vein of the literature documents the discriminatory pricing strategy undertaken by certain British publishers. The strategy is straightforward. The publisher has two prices it charges for the same journal: one price for institutions in its domestic market and most of the world and a second price, most often a higher one, to North American institutions. The rationale for this policy is presented in exchange rate risk terminology. Some authors have correctly noted that a foreign currency price (in the currency of the foreign publisher) would guarantee the foreign publishers' domestic financial return and force the libraries to convert their dollars into the foreign currency at the going exchange rate. Therefore, the exchange rate risk would be assumed by the buyers (i.e., the libraries).

Two authors, Astle and Hamaker, have taken the lead in documenting [1] and [9] this dual-pricing practice. They note that in 1984 the strategy was increasingly adopted by publishers. Publishers insisted that North American libraries pay at fixed dollar rates rather than the pound rate convertible at the time.[4/] They also note that a 1985 conference on this pricing issue forced British publishers to change their pricing structure. The U.S. price differential over the U.K. decreased from 45% in 1984 to 39% in 1986.

The persistence of the U.S.-U.K. price differential is attributed (by the publishers) to differences in the cost of postage and the cost of overseas marketing and distribution services in the United States. The former is a genuine factor, although the magnitude was not measured in Astle and Hamaker's study. However, the authors take exception to the latter argument, on grounds that most libraries order their subscriptions via agents and the value of publishers' overseas services is questionable.[5/] There are other authors who have dealt with this issue. Ruschin [18] notes that "[o]ne publisher had... the effrontery to write that this [paying in the foreign country's currency] would be acceptable as long as we [a library] paid at the U.S. subscription rate." Houbeck [11] statistically documented many price differentials. He examined 108 journals published by seven U.K. publishers and cited the rationale for price differentials to be the publisher's fear of fluctuations in foreign currency and postal rates. In an analysis of postal rates he showed that U.S. publishers shipping a journal overseas increased price by 10-15 percent, but when a U.K. publisher shipped a journal to the United States the price increased by 66 percent.

There are many articles in the literature outlining other issues which include:

- the differential between individual and institutional rates;
- alternative media (e.g. on-line availability);
- the timing of the setting of prices;
- refereeing and editorial costs;

[4/] Pergamon Press was not included in the analysis because the authors determined that Pergamon set one price for the world. However, Pergamon used an exchange rate of 2 dollars per pound, effectively making the U.S. price 30% more than the U.K. price.

[5/] According to Astle and Hamaker, certain libraries attempted to circumvent the price differential by dealing with agents who would buy the journal in the U.K. and distribute it in the United States. But this purchasing avenue was gradually closed by publishers in the U.K.

- Federal subsidies; and
- the increased number of research articles due to number of researchers and the "publish or perish" pressure.

Possible actions by libraries to reduce the serials budget requirements include:

- freeze serials collections;
- eliminate subscriptions to little used titles;
- rely more heavily on interlibrary loan;
- determine if high-quality acid free paper is necessary;
- watch for duplicate subscriptions;
- don't undertake retrospective purchases; and
- freely switch among subscription agents to ones with smaller fees.

The scattered literature has become so extensive that Serials Review recently instituted a regular column devoted to the issue for the buyers and sellers in the serials market to air their views.

ECS' study makes a contribution to this literature by using ARL as a subject matter expert and by ensuring that the ensuing analysis is economically sound. Section III, the price and cost analysis, outlines how the ECS study accounts for the many issues encountered in the literature which we reviewed. The ECS study covers serials prices charged by four major publishers, five science and technology fields (physical sciences, medicine, biology, earth sciences, and technology), and a time-frame of sufficient duration to eliminate any notion that a trend in exchange rate movements is largely responsible for price changes. Further, indices of publishers' production costs including postal rates are developed to determine if the price changes are justified by inflation in the cost of publishing.

III. ANALYSIS

This section of the paper documents the cost and price analyses.[6/] The cost analysis develops indices which represent the costs of production (from 1973 to 1987) in the

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[6/] To avoid ambiguity, the term "costs" refers to production costs (including postage) incurred by the publishers while the term "prices" refers to the subscription prices charged by the publishers to the libraries. Cost does not refer to the purchase price of a serial paid by a library.

U.S., the Netherlands, the United Kingdom and West Germany. The price analysis develops indices (also from 1973 to 1987) for the average price per page of a sample of titles published by Plenum (the U.S.), Elsevier (the Netherlands), Pergamon (the United Kingdom), and Springer-Verlag (West Germany). These indices are then compared to estimate the change in profitability (the difference between price and cost) over the time period. Finally, the price data is reorganized by academic field (physical science, medicine, biology, earth science, and technology) to determine if any specific field has experienced radically different price changes. A series of graphs is presented which compares the indices over time.

A. Costs

Our research indicated that the cost of publishing scientific journals can be divided into five major categories:[7] (1) editing labor; (2) typesetting; (3) printing labor; (4) paper; and (5) postage. Lacking data specific to the tracking of such publishing costs outside the United States (and in any of the relevant countries over time), our methodology involved selecting a base year and applying indices of cost inflation prevalent within each country to the absolute value of each cost category in the base year. The relative weights of each category, based upon reasonably detailed information available for the United States in 1975 were: 25 percent each for categories (1), (2) and (3), and 10 percent each for the last two categories. "Other" costs left unaccounted for comprise the residual 5 percent. Advertising cost/revenues were not included on the assumption that most scientific journals do not carry advertising.[8] We also assumed that the U.S. cost model could be applied to other industrial countries including the U.K., the Netherlands and West Germany during the base period since labor markets and the technology and/or access to technology in these three countries would be similar to that of the U.S. Therefore, it was assumed that the basic cost structure for scientific journal publishing would be similar across the countries concerned.

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[7] Based primarily on, Scientific Journals in the United States, by Donald W. King, Dennis D. McDonald and Nancy K. Roderer, 1981, p. 121.

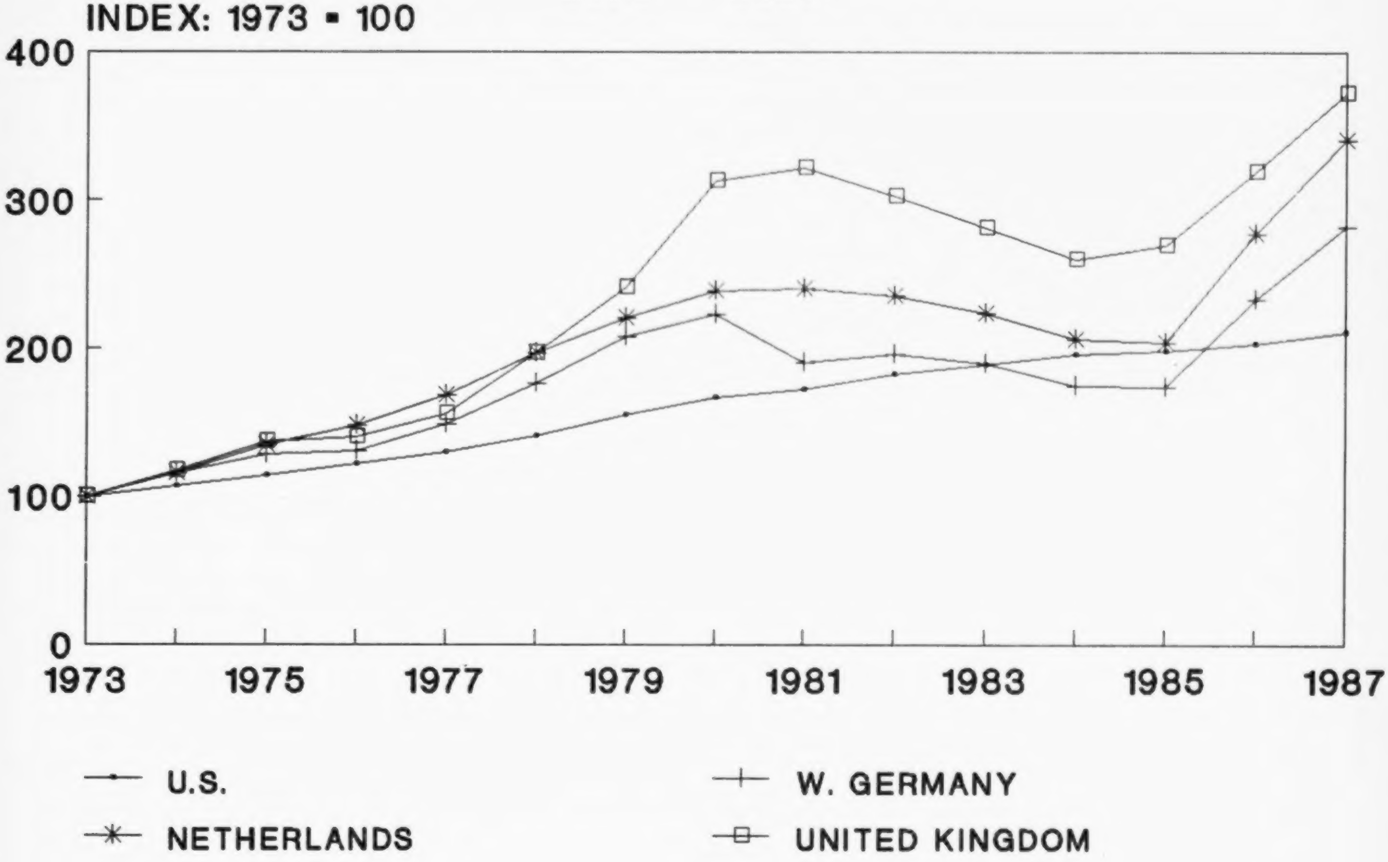
[8] This assumption is valid since the data collection effort provided advertising information on over 100 titles. Approximately 80% of these titles had little or no advertising in them.

Our methodology could be subjected to criticism on grounds that it did not explicitly consider differences in technology and efficiency among publishers in the base year and over time as they might have affected the relative weights of our cost categories. In calculating an "average" cost index, we also failed to capture what could be substantial variations in cost patterns among journals serving different fields and having different circulations. Regarding the latter two points, our sample was sufficiently broad across fields and titles that the "averaging" approach was considered appropriate. As for the first point, we recognize that changes in technology in fact have occurred. For example, typesetting costs have been steady or falling, owing to the introduction of computer-aided photocomposition, while the cost of paper has escalated. We would welcome any contributions of actual cost information from the publishing community which would enhance our index. Finally, it was not possible to distinguish between the "first copy" cost and the incremental cost of additional copies, owing to a total absence of usable data. However, if first copy costs as a fraction of total costs have not changed substantially over time, then the distinction for index development is unnecessary. The price trends will be the same. Therefore, we made this constant percentage assumption and welcome any productive contribution of data indicating otherwise.

Using the cost model described above, ECS was able to derive a reasonable index of average publishing costs for scholarly journals as produced in the U.S., West Germany, the Netherlands, and the U.K. for sale in the United States. The results are presented in graphic format in Figure 1. The U.S. cost index increases at a steady but moderate growth rate of 5.5 percent annually. This rate is reasonably consistent with the overall record of average producer costs in the United States during the time period. Considering that none of the specific U.S. data depended on the overall producer price index, this analysis suggests that United States publishing costs have increased at about the same pace as for all manufacturing.

When translated into U.S. dollars, the cost indices for the U.K., West Germany, and the Netherlands increased at an average annual rate of 9.8 percent, 7.7 percent, and 9.1 percent, respectively. The comparison of these rates of cost inflation to each country's overall producer price index is not apt because the former rates reflect the influence of fluctuations in exchange rates.

FIGURE 1
U.S. DOLLAR BASED INDEX OF AVERAGE PUBLISHING COSTS FOR THE U.S., WEST GERMANY, NETHERLANDS, AND U.K.
1973 - 1987



The details surrounding our development of the cost indices for each country are given in Appendix A.

B. Prices

Previous work in the pricing of serials that are purchased by research libraries addresses a multitude of confusing and complicated issues. In this study, ECS tried to learn from these prior studies, use ARL as an industry expert, and build upon this earlier work. This section outlines the issues of concern and describes how ECS accounted for them.

1. Issues

Some of the issues which have caused serial prices to increase are highlighted below.

- Size of journal: as journal articles proliferate, the journals increase in volume.
- Subject matter: certain fields have become more technical. The added technical language, mathematical equations, and graphics included in these articles cause publishing costs to increase.
- Exchange rate trends: as the value of the dollar decreases relative to foreign currencies, it becomes more difficult for foreign publishers to cover their costs if they receive constant dollar prices.
- Exchange rate fluctuations: the increasing volatility of exchange rates has made it difficult for foreign firms to set U.S. prices and still guarantee themselves a profit.
- Circulation: the highly specialized nature of serials implies a limited circulation level. A limited circulation level implies higher unit costs.

In ECS' study, all price analysis was done on a dollar-per-page basis. This approach eliminates the first issue, journal size, as outlined above. Some critics might argue that price-per-character should be used instead. But that approach has a major difficulty in the area of measurement. First, the number of characters must be estimated in order for it to be humanly possible to gather the data. Therefore, a measurement error is introduced. Second, technical formulas should have different character values assigned to them in order to differentiate their typesetting from straightforward text. The measurement issue here is simply the arbitrariness of any values which are assumed. It is for these reasons that a price-per-page approach was adopted.

The ECS study differentiated the price analysis by field of study. Therefore, any inherent cost impacts of more technical journals can be addressed. It could be argued that one technical field's journals may be more costly to produce than another and therefore higher prices may be justified. Therefore in gathering the data sample, we planned on estimating trend results for the separate academic fields as well as for each publisher.

One of the arguments put forth by certain publishers is that their recent price increases have been fueled by the U.S. dollar's depreciation. If the dollar decreases in value, then foreign firms must charge higher dollar prices in order to receive the same home currency price. Our study dealt with exchange rate trends by including in our analysis a time frame which includes both a substantial increase and a substantial decrease in the value of the dollar. By analyzing 1973 to 1987, the entire spectrum of exchange rate trends is covered.9/

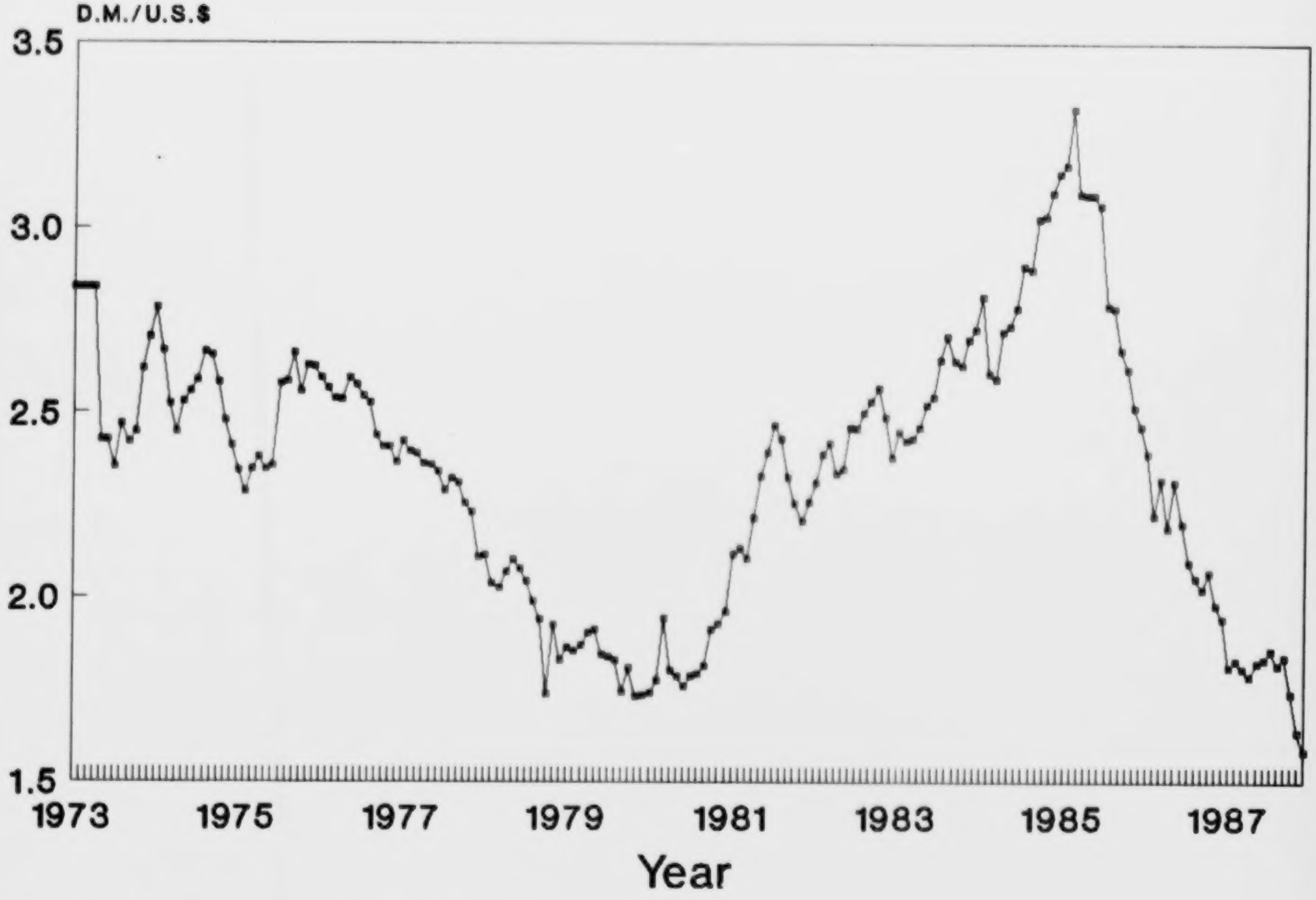
Another argument for recent price increases is the increase in exchange rate risk faced by publishers. Since the publishers often quote two currency prices and allow the libraries to pay in either currency, the publishers are in fact absorbing any exchange rate risk.10/ The anecdotal evidence we have gathered does not indicate that exchange rate risk for firms in West Germany, the Netherlands, or the United Kingdom were any greater in 1988 than they were in 1973. Figures 2-4 plot the exchange rates from 1973 to 1988 for the three countries. It does not appear at this level of analysis that exchange rates are any more volatile in 1988 than in 1973.

9/ Note that to be included in the sample, a title had to be published since 1980. This time frame includes a large dollar appreciation (1980-1985) and depreciation (1985-1987).

10/ Note that if the publishers only quote prices in their home market currency, then they would have no exchange rate risk.

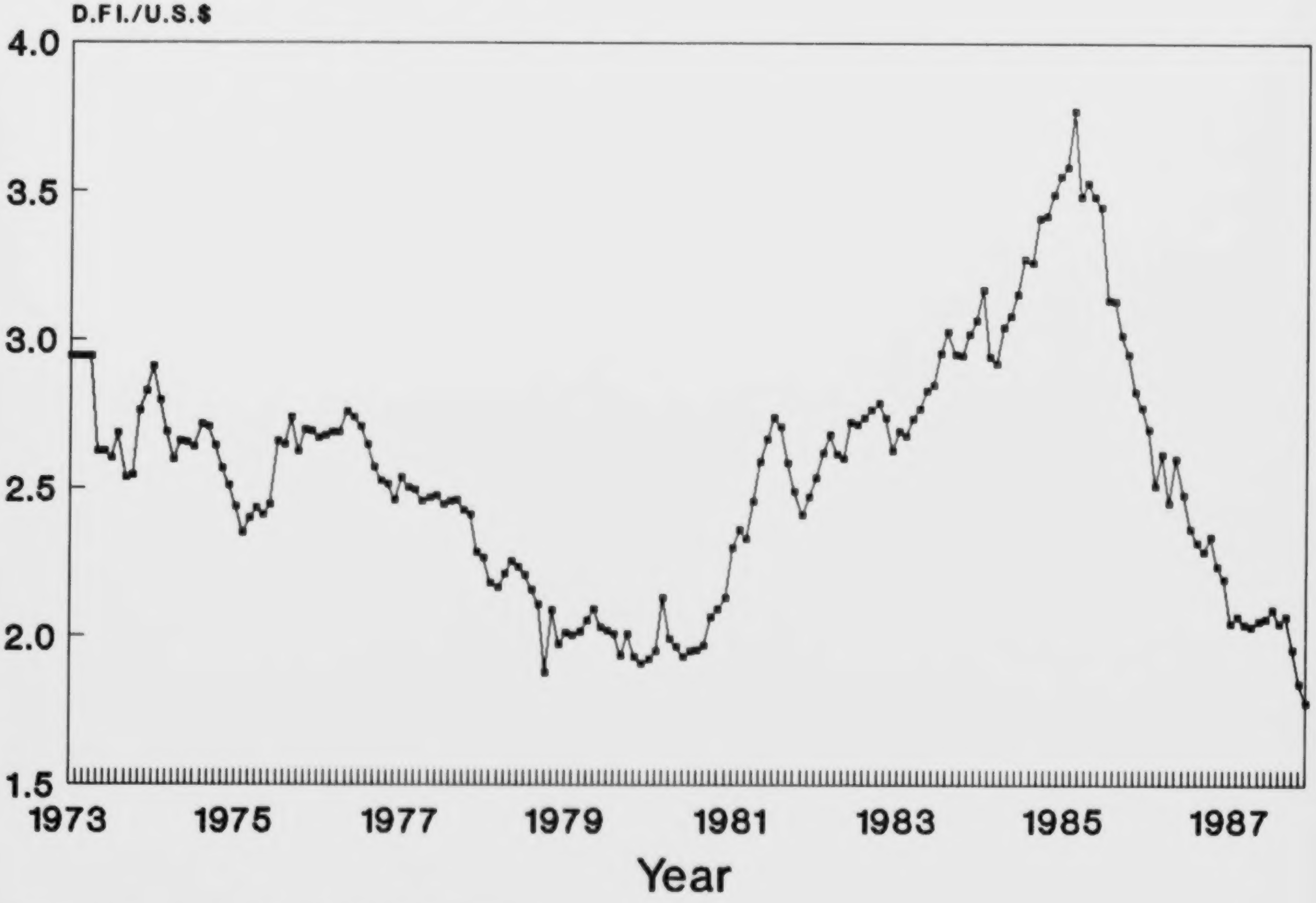
FIGURE 2

WEST GERMANY: NOMINAL MONTHLY EXCHANGE RATES DEUTSCHE MARKS PER U.S. DOLLAR, 1973 - 1987



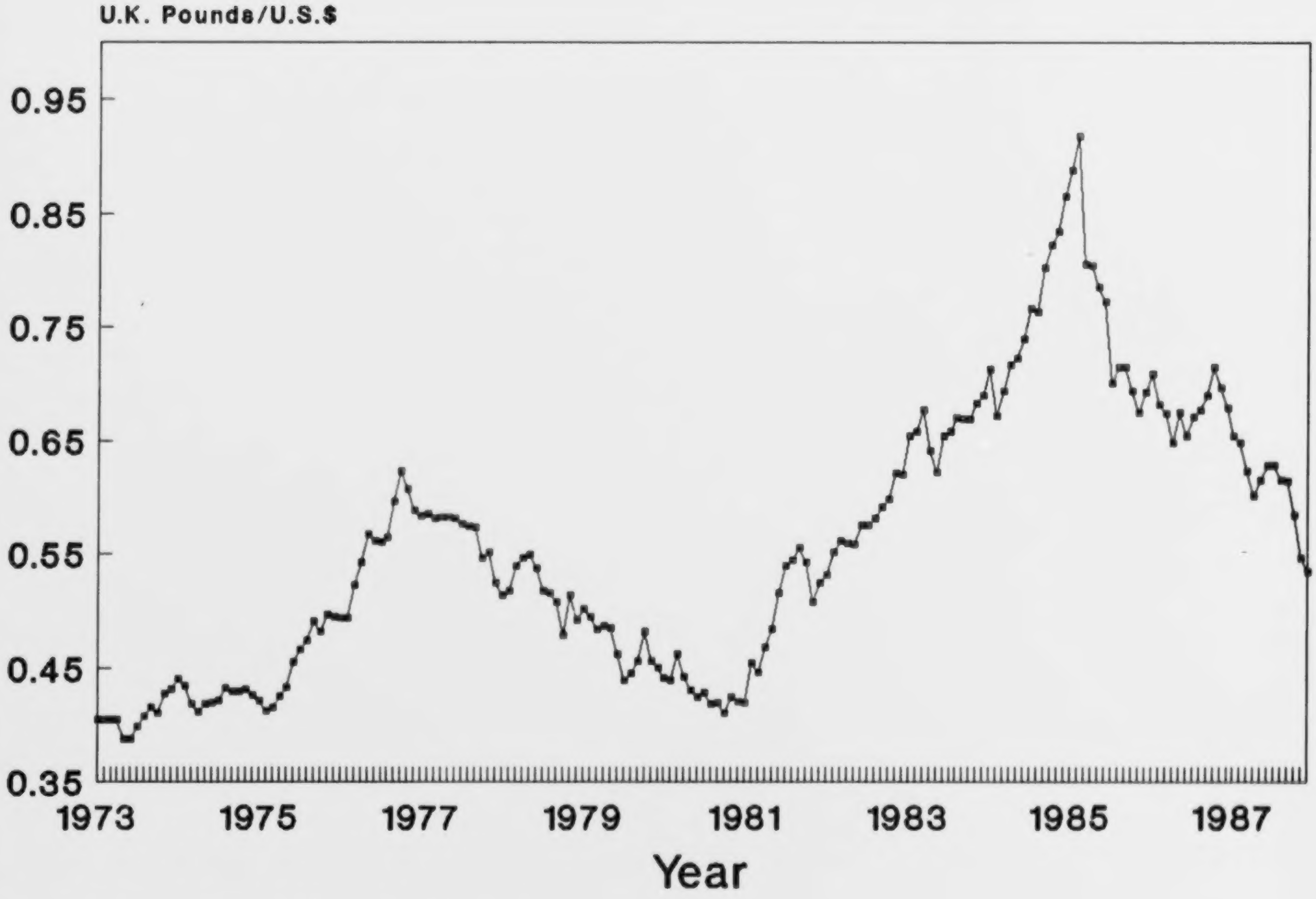
Source: International Monetary Fund

FIGURE 3
NETHERLANDS: NOMINAL MONTHLY EXCHANGE RATES
DUTCH GUILDERS PER U.S. DOLLAR, 1973 - 1987



Source: International Monetary Fund

FIGURE 4
U.K.: NOMINAL MONTHLY EXCHANGE RATES POUNDS PER U.S. DOLLAR, 1973 - 1987



Source: International Monetary Fund

Lower circulation levels for the publishers would imply higher costs per unit of production and hence higher prices for the libraries. Unfortunately, for the purposes of this analysis, circulation data could not be obtained in a systematic manner because the publishers generally regard such data as confidential. The cost-cutting efforts of various libraries and their effort to eliminate unneeded serials from their collections suggest that circulation levels may be falling. On the other hand, the increased number of academic researchers and the pressure to publish suggest that circulation levels may be increasing.[11/]

2. Sample Selection and Data Collection

Careful attention was paid to designing the sample of titles for study. There were several goals. A sufficiently large sample had to be obtained in order to guarantee statistically meaningful results. Second, the sample had to encompass four different publishers and five different academic fields. It was necessary to generate a sufficient number of titles to ensure that each parameter (field or publisher) had adequate representation. Originally, the intent was to study trends in serial prices by field and publisher, e.g., Elsevier's physical science journals. However, it was determined that each publisher does not produce enough titles within each field to permit such an analysis. Therefore, it became necessary only to generate enough titles to cover each publisher (e.g., Elsevier's journals) and each field (e.g., physical science journals). Finally, the sample had to be randomly generated.

A sample size of 165 titles was determined to be adequate for the goals outlined above. The sample was randomly selected by using each publisher's catalog and choosing every 7th or 8th title depending on the size of the catalog.[12/] The ultimate number of titles in the publisher and field samples are:

[11/] The only evidence we have of circulation trends is contained in the data set collected for five of the Plenum titles. The circulation growth rates for these specific titles are -1.2%, 0.0%, 1.0%, 4.1%, and 4.5%.

[12/] A further criterion in this random selection was that each title had to be currently published and published since 1980. Thus, a sufficient time period could be guaranteed for the analysis. If the title selected in the random selection process did not meet this criterion, then the process was continued.

	Number of Serials
Elsevier	65
Springer-Verlag	35
Plenum	23
Pergamon	42
Total	165
Biology	28
Earth Science	11
Medicine	54
Physical Science	45
Technology	27
Total	165

To gather the data, ARL, its support staff, and its network of librarians entered the stacks and catalogued the price and page information. Each data collector had a standardized form to complete. See Appendix B for a sample form. In addition to price and page information, there was a great deal of additional information requested such as circulation, the extent of advertising, field of study, page charges, submission fees, editorial remuneration, country of origin, and number of volumes and issues.

The most careful attention was paid to the accuracy of price and page data. When the data seemed questionable they were double-checked. If double-checking was impossible in the time frame available, then careful thought was given to exclusion of the data item. A small number of titles was deleted as a result. With 15 years' worth of data, 165 titles, and both price and page data, there were almost 5000 potential data items to be included in the price-per-page analysis. If the data were incomplete due to inaccurate or incomplete library holdings, then the particular data point was discarded. In some cases the entire title had to be omitted. Further, adjustments had to be made to some of the page data due to a changed printing format for particular titles. Appendix C documents these data adjustments. Such exclusions of unsubstantiated data and other adjustments are typical in statistical surveys of this nature.

In the price-per-page analysis, a U.S. dollar price was used when available. If the dollar price was unavailable and a foreign currency price was available, then the latter was converted to U.S. dollars using average exchange rates, which are available in the International Monetary Fund's

International Financial Statistics.[13] The exchange rate for August was used as the month in which the publisher sets its prices.

3. Price per Page Calculation

An index for each title was created with the price per page in 1980 being set equal to 100. 1980 was chosen as the base year because a title was only included in the sample if it was published back at least that far. An index alternative was chosen for the analysis due to the nature of the varying size of the sample.

The impact of a varying sample size on simple price per page analysis versus an index analysis can best be clarified with an example. Suppose there are two publishers producing three titles for three years and the price-per-page data is as follows:

Year	1	2	3
Title 1	.20	.28	.38
Title 2	.25	.30	.36
Title 3	.30	.32	.34
Average	.25	.30	.36

The trend in average price per page shows a twenty percent increase in prices in the second and third year. Suppose, however, that one publisher continues to increase the average price per page for its existing titles by twenty percent (to $.45) and add an inexpensive title (say $.09) while the other publisher holds its average price per page steady (at $.36 per page) and adds an expensive title (say $.92 per page). The first publisher would show an average price per page in the fourth year of $.36 while the second publisher would show one of $.50. Yet, it is the first publisher who is unable to avoid price increases and not the second one.

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[13] It could be argued that, if both U.S. and foreign currency prices are available then the minimum should be used. However, the hierarchy used in the study (to use the U.S. dollar price if available) reflects the presumed predisposition of the libraries to pay in their home market currency. Further, the assumption should not affect the price-per-page analysis because after being converted to a common currency, the price behavior over time should be similar. The two prices should move together after being adjusted for exchange rate movements.

Utilizing an index approach eliminates the problem indicated in the above example by creating a common and equal comparison point for each title. Thus, the focus is on price trends, not absolute prices. Let the fourth year be the base year for both publishers and set the index equal to 100. In the third year, the first publisher's index would be 80[(.36/.45) x 100] and the second publisher's index would be 100 [(.36/.36) x 100]. Similar calculations can be made for the other years. The indices for the two publishers are:

	Index			
Year	1	2	3	4
Publisher 1	56	67	80	100
Publisher 2	69	83	100	100

The impact of the additional title in the fourth year is eliminated and the first publisher is shown to be increasing prices by twenty percent while the other publisher is not. The primary purpose of using indices is to enforce a common comparison point for all of the titles (1980) and focus on changes in prices, not absolute levels.

4. Trends in Price per Page

The actual price-per-page results are presented in this section for each publisher and, after sorting the data, for each academic field. The analysis (covering the years 1973-1987) indicates that Pergamon's rate of increase in price per page is the highest, estimated at 14.4% per year. The other rates of increase are 12.2% per year for Plenum, 12.1% for Elsevier, and 10.3% for Springer-Verlag.

Plenum often argues that its translation titles are exceptionally expensive to publish and therefore should be considered separately from any analysis of average price. To address this issue, ECS split the Plenum sample into two subsamples, regular serials and translation serials. The rates of increase in price per page over the same time period are 12.2% and 12.1%, respectively, a difference of only one-tenth of a percentage point. Therefore, one could conclude that even though the absolute levels of Plenum's prices for translation journals may exceed their regular titles, the rates of increase are almost identical.

The other sorting of the data is by academic field. It is argued that some fields of study have become extremely technical. If one field has become relatively more technical than another, then the technical serial might have justifiably greater price increases due to relatively greater publishing complexity. In order to address this issue, the price-per-page analysis was conducted on a field-by-field basis; all titles for a specific academic field were aggregated regardless of the publisher. The price-per-page rates of increase over the time period 1973-1987 are estimated to be:

Academic Field	Percent Rate of Increase
Physical Science	12.6
Technology	11.4
Medical	11.8
Earth Science	12.1
Biology	13.5

Needless to say, the range of price increases across various fields is not extensive. Therefore, the contention that the rate of price increases in one scientific field over the other owing to the former's greater "technicality" is not borne out to any substantial degree.[14/]

C. Price-Cost Comparison

Integration of the cost and price analyses provides a clear indication of profit trends in the serials publishing industry. Each publisher's price-per-page analysis is matched with the relevant country's cost index. They are both indexed to 100 in the base year, 1973, and presented in Figures 5 through 8. For the entire time span 1973-1987, these graphs clearly depict the rapidly growing disparity between costs of publishing and subscription prices charged to libraries. The differentials between the two can be seen in Table 1. The field-specific, price-per-page analyses are presented in Figures 9 through 13.[15/]

The price-cost comparison over the 1980-1987 time frame was also analyzed. The precision of our analysis over this shortened time frame is enhanced because the cut-off point for a title to be included in the sample is 1980. Therefore,

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[14/] Note that this analysis does not address the issue of average increases in publishing complexity. This issue is covered in the cost analysis section.

[15/] Cost indices are not included in these graphs because there would be no additional insight gained.

the sample data is more comprehensive. Further, the dollar has gone through both a massive appreciation and a massive depreciation which implies that any conclusions drawn from a price-per-page analysis will not be dependent on a singular movement in the exchange rate. The results from the firm specific analysis over this shortened time frame are presented in Table 2.

IV. CONCLUSION

In our estimation, each targeted publisher has increased subscription prices for the sample of titles examined at a much faster rate than the rate at which their costs have increased. The range of the difference between the annual growth rates of price per page and costs is from 2.6 to 6.7 percentage points. If we restrict the analysis to the time period 1980-1987, then the range is from 4.5 to 12.9 percentage points.

If such estimated rates of growth are reasonably accurate, then the library community would benefit greatly from such measures as the encouragement of new entrants into the business of serials publishing, and the introduction of a program to stimulate greater competition among publishers by injecting a routine of competitive bidding for publishing contracts of titles whose ownership is not controlled by the publishers.

TABLE 1

Price-Cost Differential Growth Rates
(1973-1987)

Publisher/Country	Percentage Growth in Price/Page	Percentage Growth in Costs	Differential
Elsevier/ Netherlands	12.1	9.1	3.0
Pergamon/ United Kingdom	14.4	9.8	4.6
Plenum/ United States	12.2	5.5	6.7
Springer-Verlag/ West Germany	10.3	7.7	2.6

TABLE 2

Price-Cost Differential Growth Rates (1980-1987)

Publisher/Country	Percentage Growth in Price/Page	Percentage Growth in Costs	Differential
Elsevier/ Netherlands	9.7	5.2	4.5
Pergamon/ United Kingdom	15.4	2.5	12.9
Plenum/ United States	11.4	3.4	8.0
Springer-Verlag/ West Germany	8.5	3.4	5.1

FIGURE 5

NETHERLANDS: COMPARISON OF PRICE AND COST INDICES FOR SCHOLARLY JOURNAL PUBLISHING 1973 - 1987

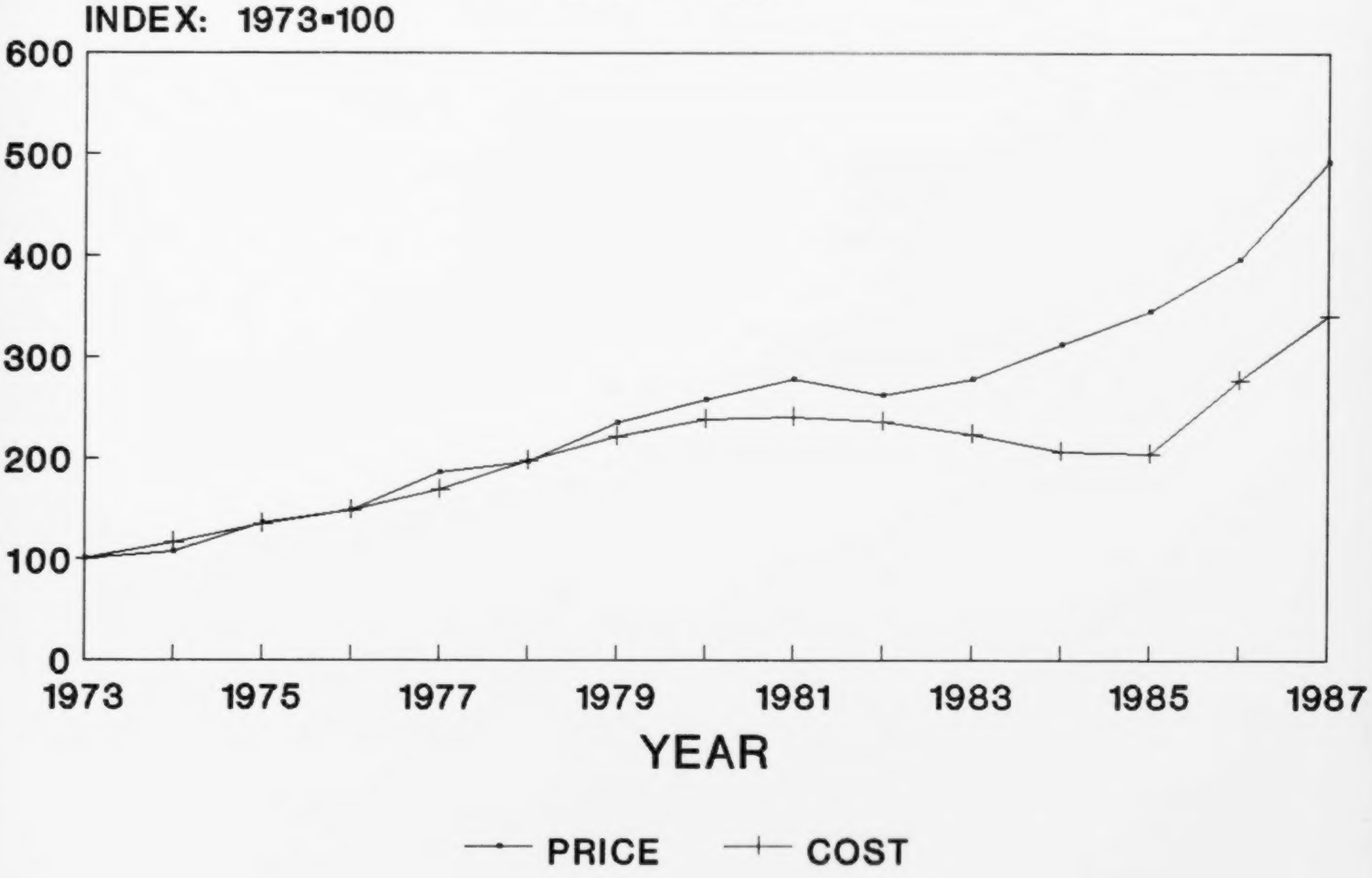


FIGURE 6

U.K.: COMPARISON OF PRICE AND COST INDICES FOR SCHOLARLY JOURNAL PUBLISHING 1973 - 1987

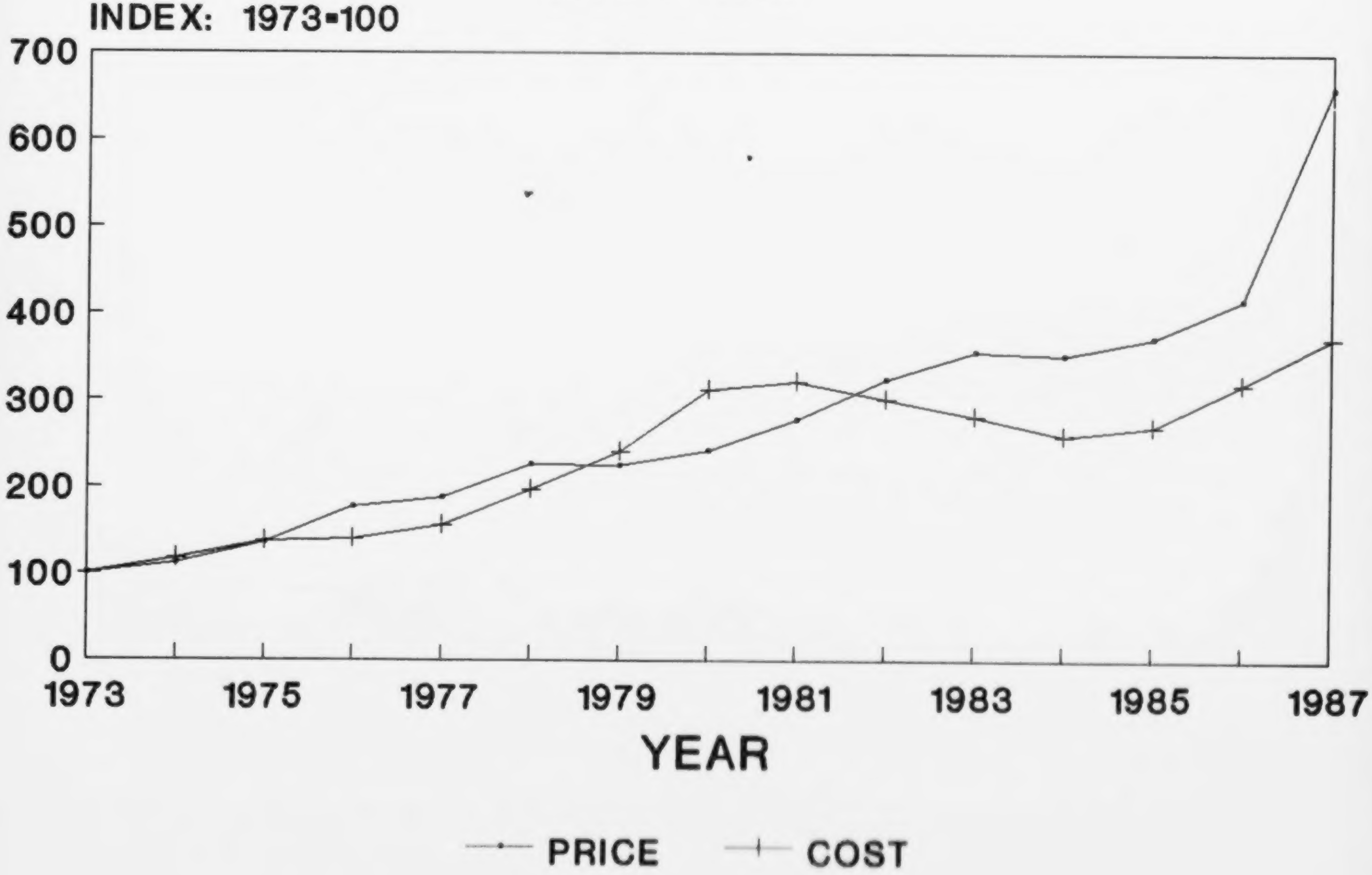


FIGURE 7
U.S.: COMPARISON OF PRICE AND COST INDICES
FOR SCHOLARLY JOURNAL PUBLISHING
1973 - 1987

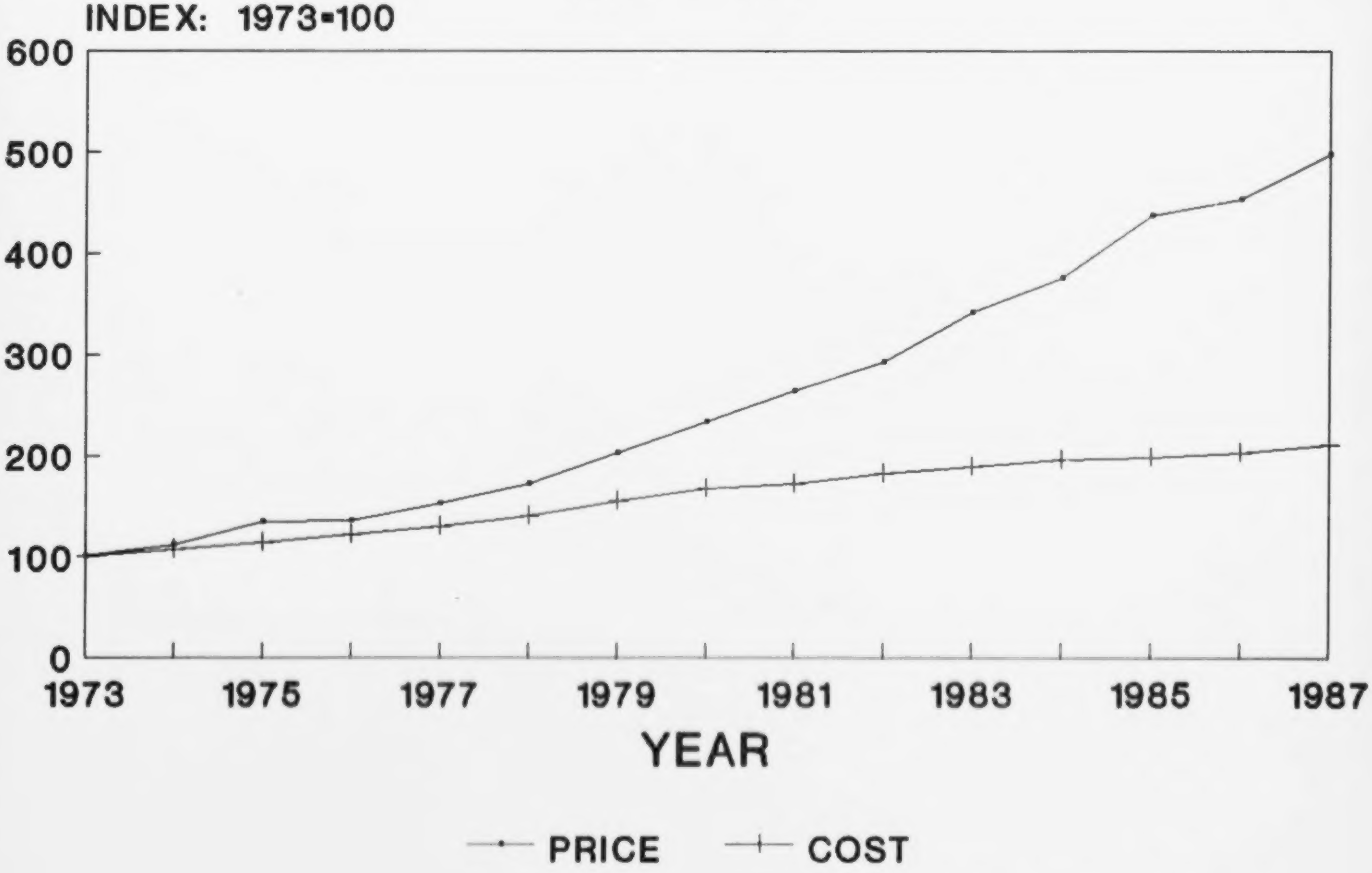


FIGURE 8

WEST GERMANY: COMPARISON OF PRICE AND COST INDICES FOR SCHOLARLY JOURNAL PUBLISHING

1973 - 1987

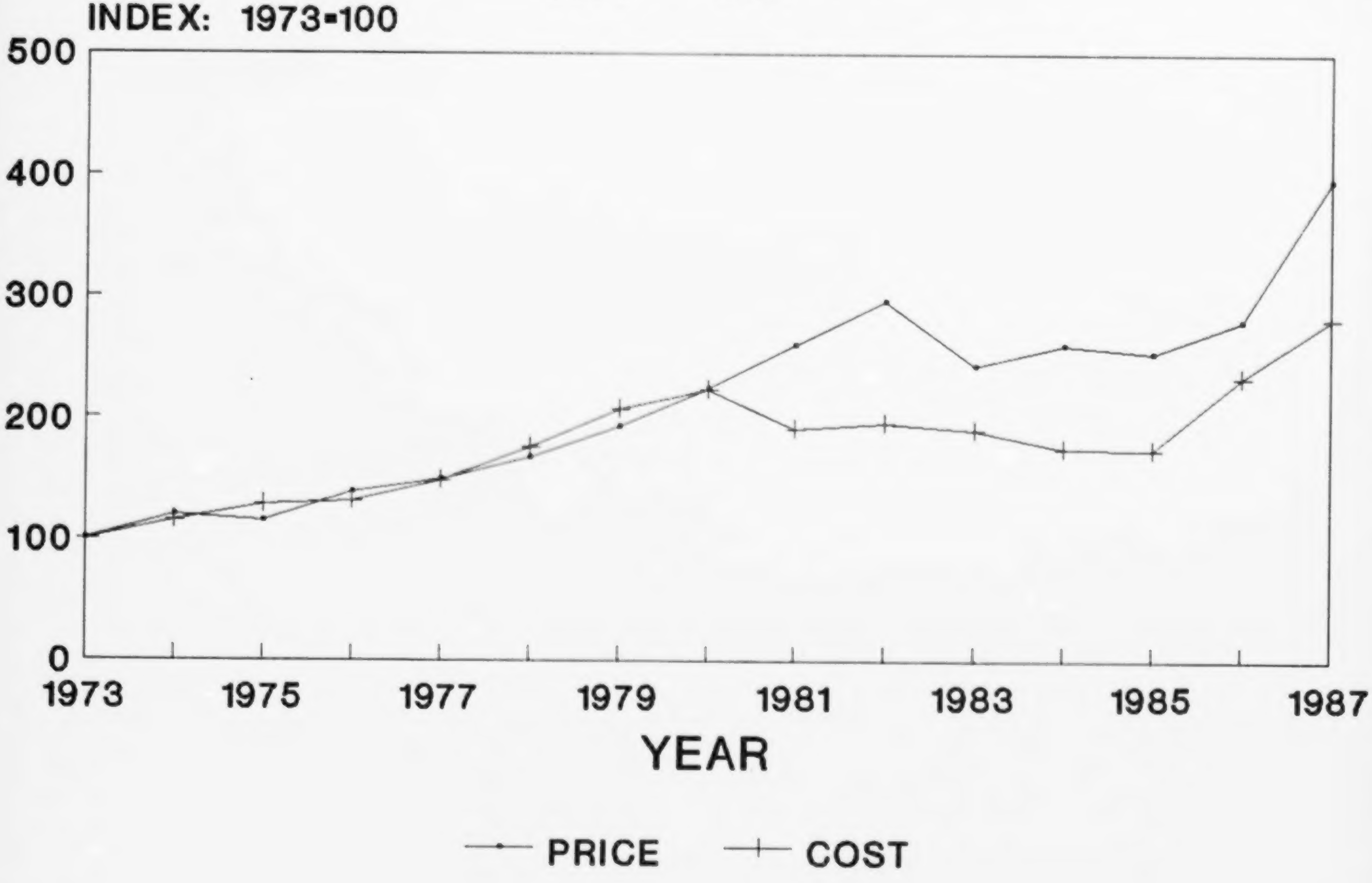


FIGURE 9
FIELD SPECIFIC PRICE PER PAGE TRENDS
PHYSICAL SCIENCE
1973 - 1987

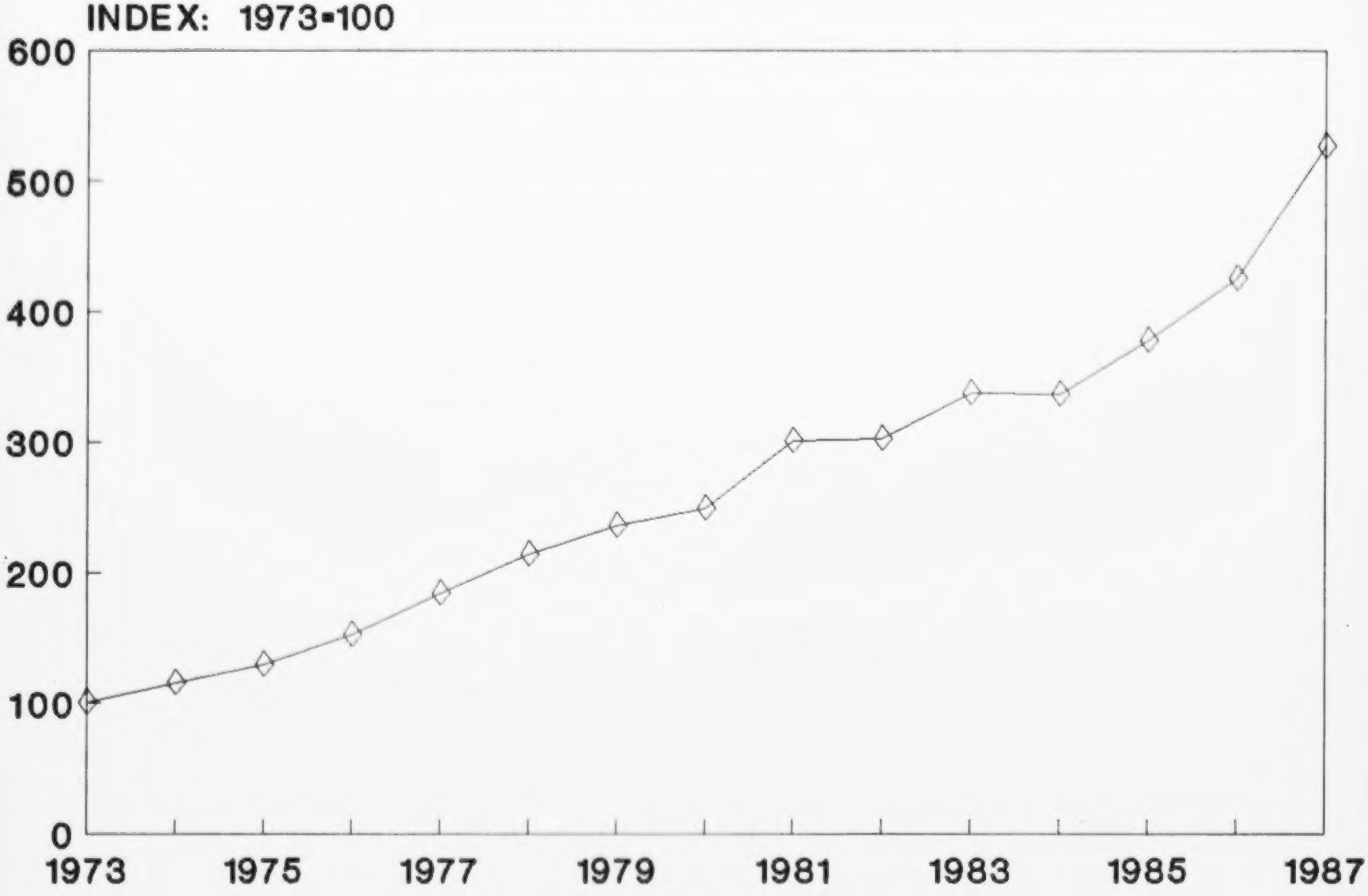


FIGURE 10
FIELD SPECIFIC PRICE PER PAGE TRENDS
TECHNOLOGY
1973 - 1987

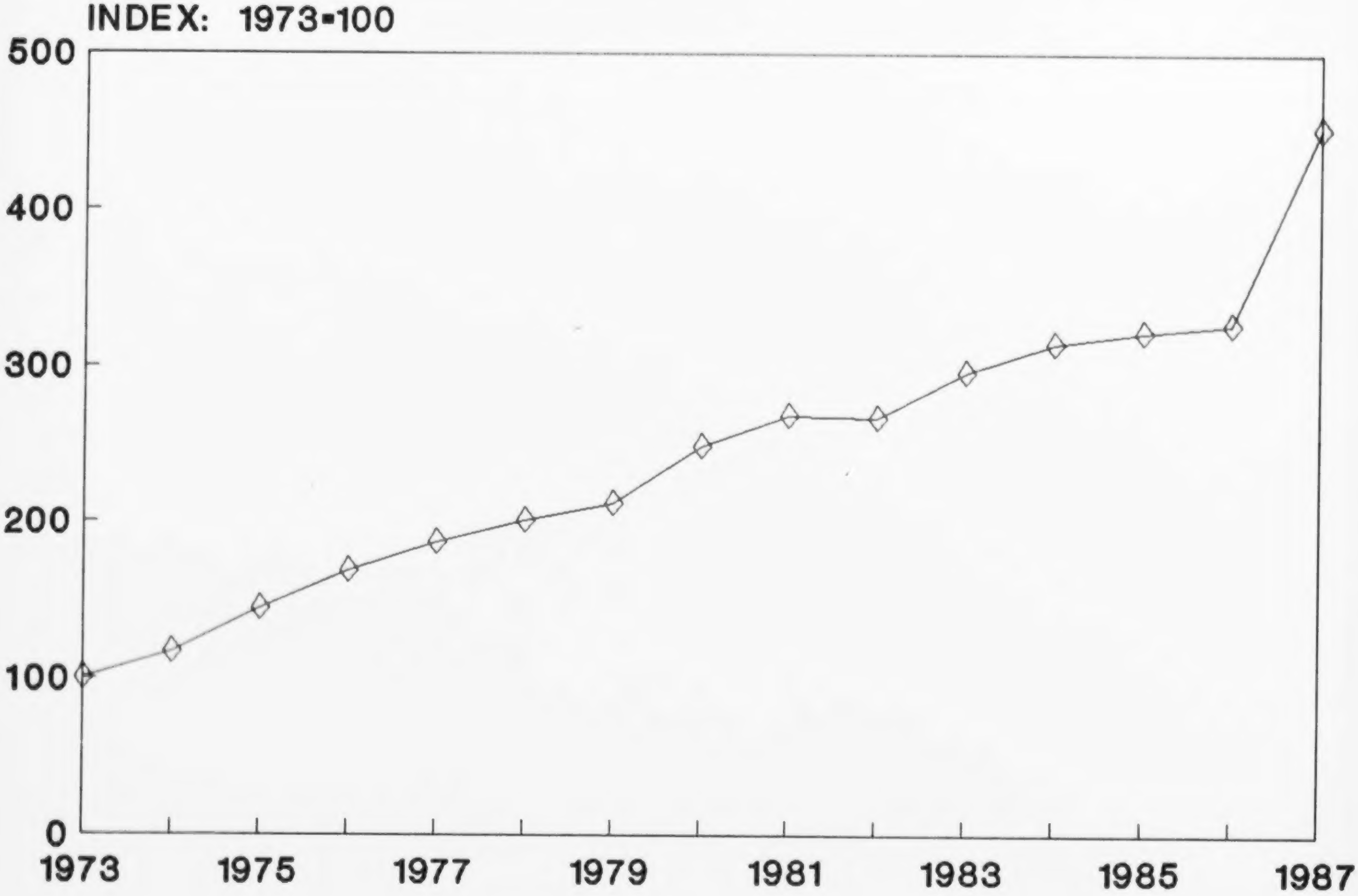


FIGURE 11
FIELD SPECIFIC PRICE PER PAGE TRENDS
MEDICAL
1973 - 1987

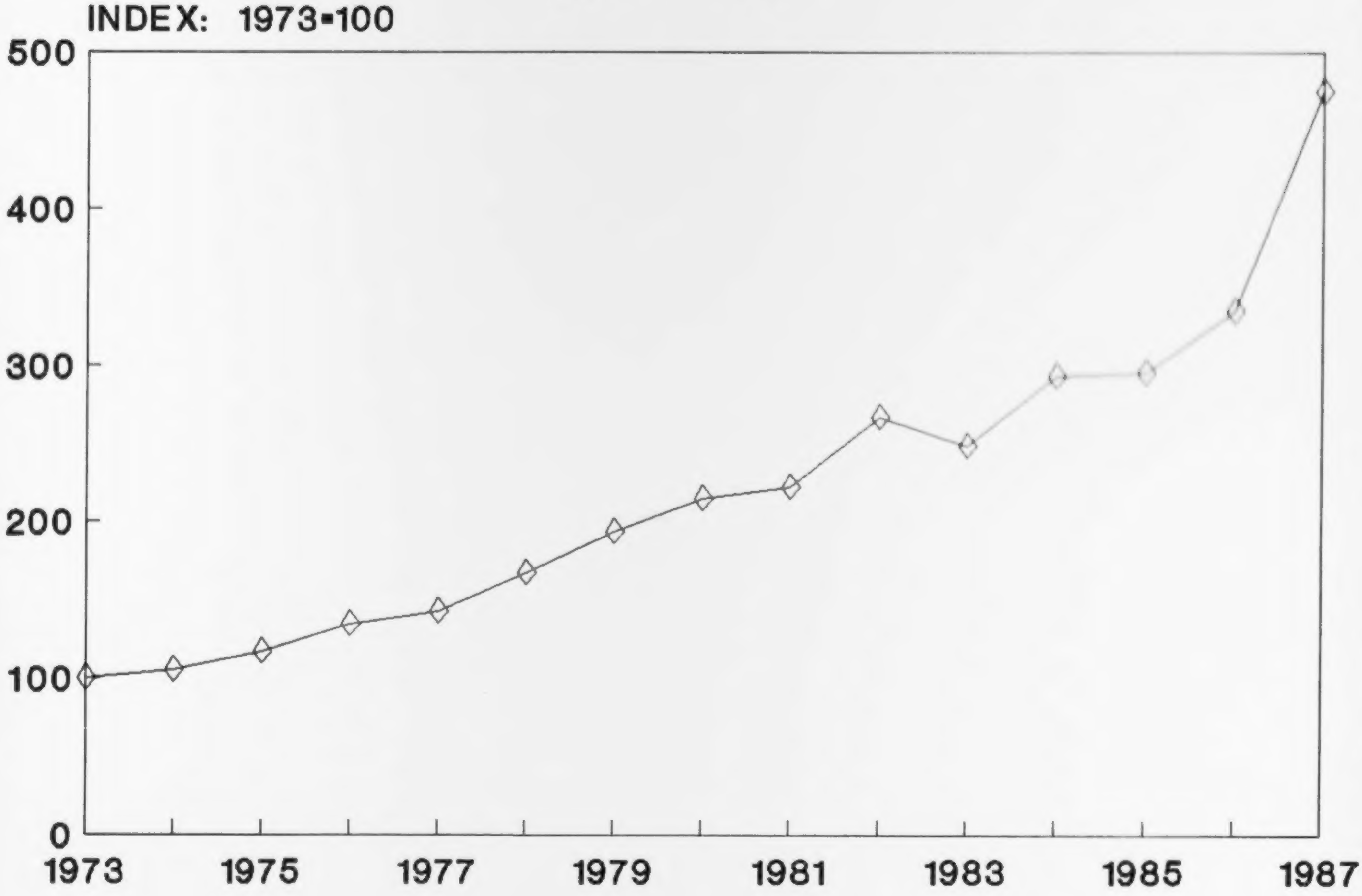


FIGURE 12
FIELD SPECIFIC PRICE PER PAGE TRENDS
EARTH SCIENCE
1973 - 1987

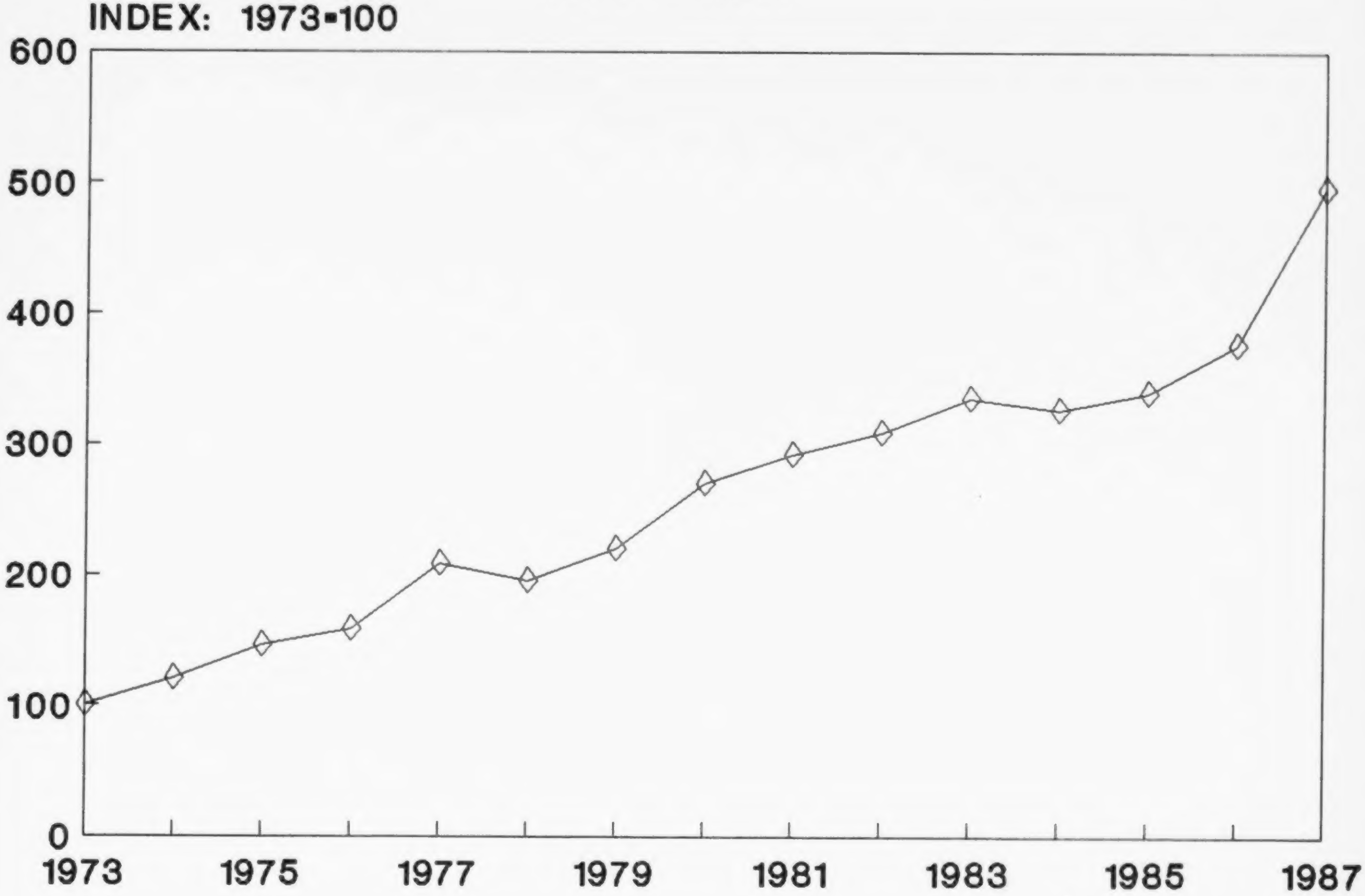
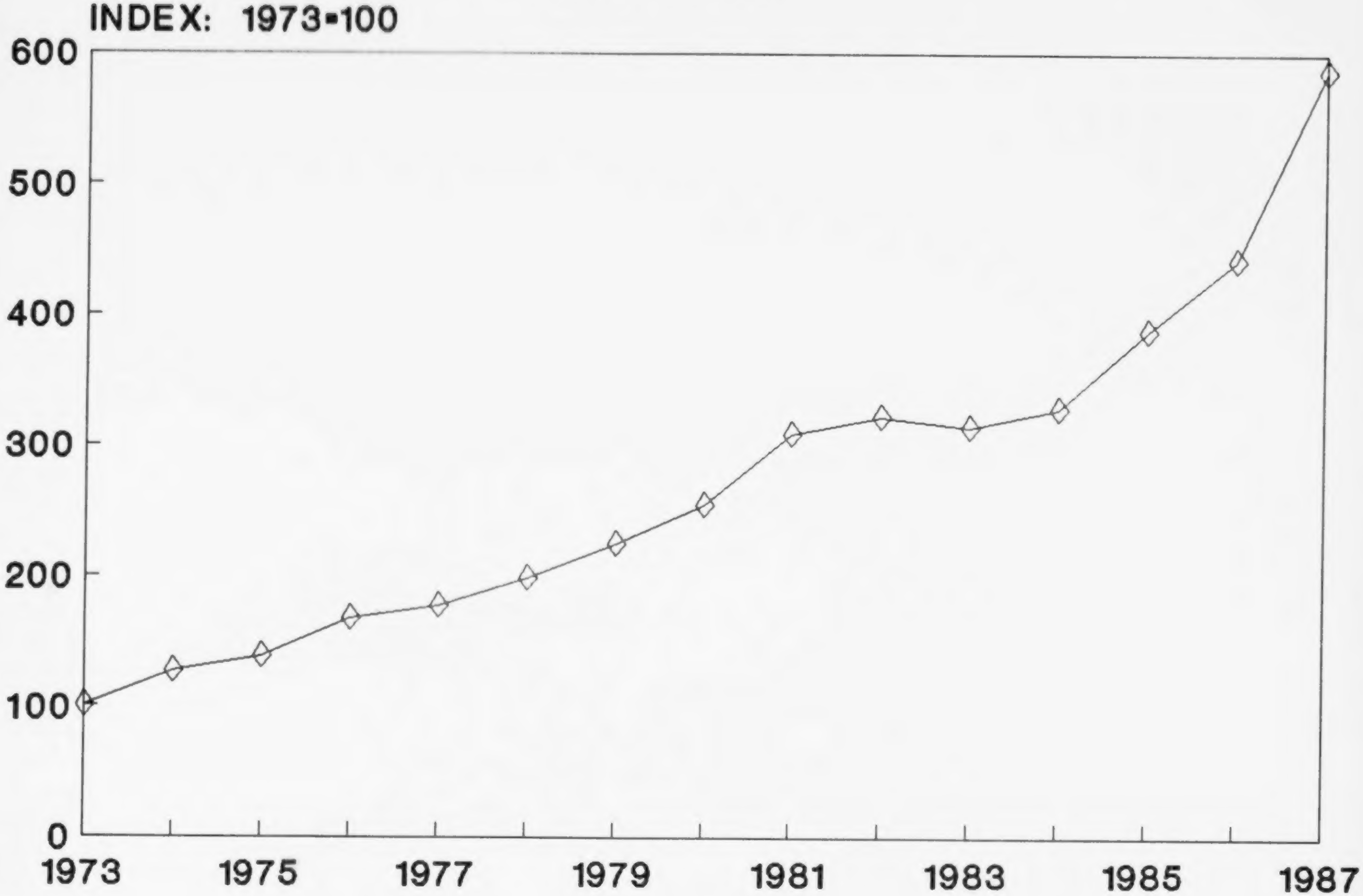


FIGURE 13
FIELD SPECIFIC PRICE PER PAGE TRENDS
BIOLOGY
1973 - 1987



Appendix A

A. U.S. Cost Index Development

ECS contacted a variety of government agencies (U.S. Department of Commerce, International Trade Administration; U.S. Department of Labor, Bureau of Labor Statistics), a trade association (Society for Scholarly Publishing), a trade magazine (Folio Magazine), several industry experts and reviewed the relevant published literature in the course of our research. Due to the fact that actual publishing costs are generally a closely guarded secret at most publishing houses, our research ultimately yielded the following data:

(1) Editing labor costs: no "hard" numbers could be found. Average salaries of faculty members with the rank of professor at U.S. institutions of higher education were used as a proxy and were taken from the U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, various editions. [1974 through 1987; 1973 was estimated as the average of 1972 and 1974.] Salaries of professors at public institutions were averaged with salaries of professors at private institutions. An index was then calculated using 1973 as the base year of 100.

(2) Typesetting costs: obtained producer price index information from the U.S. Department of Labor, Bureau of Labor Statistics, Labstate Series Report, industry code 2791. This information is monthly for June 1985 through August 1988, and annual figures are given for 1986 and 1987. An annual figure for 1985 was estimated based on the average of the monthly figures for June through December 1985. Figures for earlier years were extrapolated based on information in the King book[15/] as follows:

   (a) Table 4.29 on p. 123 of the King book gives "Per page typesetting costs of basic text, 1960-1985." Current dollar per page cost for 1975, 1980 and 1985 was taken from here.

[15/] King, *Ibid*.

Figures for the years 1973, 1974, 1976-1979, and 1981-1984 were estimated as follows:

(1) Figures for 1981-1984 were estimated based on the average growth rate from 1980 to 1985 = 3.18% per year.

(2) Figures for 1976-1979 were estimated based on the average growth rate from 1975 to 1980 = 6.10% per year.

(3) Figures for 1973 and 1974 were estimated based on the average growth rate from 1975 to 1980 = 6.10% per year.

Note that the index information from the Bureau of Labor Statistics was reindexed to set 1985 = 100. At the same time the 1985 figure from the King book was set equal to this index of 100.

(3) Printing labor costs: 1983 to 1987 index based on information from the U.S. Department of Labor, Bureau of Labor Statistics, Labstat Series Report, industry code 2732-2C (book printing: technical, scientific, business and professional books). Note that the 1983 annual index figure of 100 was based solely on the December 1983 index of 100. Earlier index figures are not available. Figures for earlier years were extrapolated from information in the King book[16/] as follows:

(a) Table 4.30 on p. 123 of the King book gives "Printing cost elements, 1960-1985." Current dollar wage index for union printers was taken from here for the years 1975, 1980 and 1985. Figures for the years 1973-1974, 1976-1979, 1981 and 1982 were estimated as follows:

(1) Figures for 1973 and 1974 were estimated based on the average growth rate from 1975 to 1980 = 5.51% per year.

[16/] Ibid.

(2) Figures for 1976-1979 were estimated based on the average growth rate from 1975-1980 = 5.51% per year.

(3) Figures for 1981 and 1982 were estimated based on the average growth rate from 1980 to 1983 = 5.31% per year.

(4) Paper costs: information was taken exclusively from the U.S. Department of Labor, Bureau of Labor Statistics, Labstat Series Report, product code 2621-4 for book paper, uncoated free sheet for 1974-1987. The 1973 index was estimated based on the 1974-1979 growth rate = 8.10% per year.

(5) Postage costs: information obtained from the U.S. Postal Service on Second-Class Mail, Regular Rate and Publisher's Commingled Rate, Non-Advertising Portion for 1973-1987. Information was given in cents per pound for each date for which there was a change in the postal rate. ECS derived a weighted average rate per year from this data by weighing each rate by the number of months for which it was in effect. The weighted average postal rates were then converted to an index using 1973 as the base year.

B. Foreign Cost Indices: West Germany, the United Kingdom, and the Netherlands

We were unable to obtain any cost information from the appropriate embassies, the government statistical bureaux or related trade associations in West Germany, the United Kingdom,[17/] or the Netherlands.[18/] See Table A-1 for a list of the sources of foreign cost information which we contacted. Consequently, the U.S. cost model was modified to include only three categories: (1) printing labor costs (25%); (2) postage costs (10%); and (3) "residual" (65%).

17/ In particular, disclosure problems in the U.K. make it very difficult to obtain any meaningful data on costs in the publishing field.

18/ The Netherlands government apparently does not keep any statistical information on the publishing industry. Therefore it was necessary to contact private trade associations and private research firms.

Table A-1

Sources Contacted for Foreign Cost Information

U.K.

British Printing Industries Federation
British Information Service in N.Y.
Publishers Association
British Embassy (Washington, D.C.)
Association of Scholarly and Professional Society Publishers
Business Statistics Office (Wales)

Netherlands

Central Bureau of Statistics
Royal Dutch Publishers Association
Stitching Speurwerk
Embassy of Netherlands (Washington, D.C.)

W. Germany

Embassy of Federal Republic of Germany
German Federal Statistical Office

[Note: There were several other places which we attempted to contact without success.]

Labor cost data was obtained from the U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, "Hourly Compensation Costs for Production Workers, Printing and Publishing (U.S. SIC 27), 22 Countries, 1975-1987," unpublished data, September 1987 and August 1988; data for 1973 and 1974 were estimated using "Hourly Compensation Costs, Hourly Direct Pay and Pay for Time Worked for Production Workers in Manufacturing, Ten Countries, 1960-1985".19/ Printing labor costs were then indexed using 1973 as the base year.

Information on postal rates to the United States from West Germany, the United Kingdom, and the Netherlands from 1973-1988 was obtained from the Universal Postal Union in Berne, Switzerland.20/ This information was given in local currency. Based on an average number of pages per journal issue of between 50 and 250 pages, we calculated an annual average of the postal rates for the Universal Postal Union (UPU) classification 5.5-5.8 (100-2000g.). These annual average postal rates were then converted to an index using 1973 as the base year.

Lacking any further specific cost data for these three countries, the "residual" was estimated based on actual U.S.

19/ 1973 and 1974 were estimated by calculating the five year average (1975-1979) hourly compensation costs for production workers for printing and publishing (US SIC 27) versus for all manufacturing. The percent difference between the two was calculated and applied to the actual figure for all manufacturing for the appropriate year.

20/ According to John Tagler, Marketing Director at Elsevier in New York, their journals are shipped via Surface Air Lift from Amsterdam to five locations in the U.S., after which they go by Magazine Rate within the U.S. ECS, however, was unable to obtain details of arrangements for Surface Air Lift, which is not a publicly available service. Special arrangements are negotiated on an individual basis. According to Mr. Briggs at the Universal Postal Union in Berne, Switzerland the rate would depend on the amount of traffic (i.e., a lower rate would be associated with a higher volume of traffic). The Surface Air Lift rate would be more expensive than the surface rate but less expensive than the air mail rate. Thus our costs for this category may be overstated, resulting in an overstatement of the total cost index and an understatement of the difference between price and cost.

cost data for 1980 for the three categories of paper, typesetting, and editing. Using 1980 as the base year, producer price indices for the relevant country were applied to the actual 1980 U.S. cost to derive a "residual" amount for each year.[21/] Thus, the estimated "residual" amounts should reflect changes in cost inflation over time specific to each country. The "residual" cost was then indexed using 1973 as the base year. Given the lack of the specific cost data, the overall producer price index was deemed to be the best proxy.

The total cost index for each of the three countries was calculated by applying the weights for each of the three categories to the index for each category. The resulting total cost index based in local currency was converted to U.S. dollars using annual exchange rates cited in the International Monetary Fund, International Financial Statistics, various editions.

[21/] Producer price index information was given in the International Monetary Fund, International Financial Statistics, item 63, various editions.

Appendix B

Title ____

Publisher ____________________ Country ____________________

Subject: PS Med Bio ES Tech Advertising? Yes No

Costs: Page charges: ______________ Submission fee: ______________

Any remuneration to editors? ______________________________

	Foreign Prices			U.S. Prices			Circulation	Vol/	Iss/	Pages/
	Indiv.	Inst.	Other	Indiv.	Inst.	Other		Yr.	Yr.	Yr.
1973										
1974										
1975										
1976										
1977										
1978										
1979										
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988										

Earlier title: (Please complete and attach separate record for each title back to 1973) ______________________________

Other comments: ______________________________

Appendix C

Serial Titles Eliminated or Abbreviated from the Randomly Selected Sample

A. Titles Eliminated

Four titles were eliminated from the original sample of 165. They are:

Title	Publisher
Current Advances in Plant Science	Pergamon
Clinical Immunology Newsletter	Elsevier
Developmental Biology and Teratology	Elsevier
Human Genetics	Elsevier

No page information could be gathered for Developmental Biology and Teratology while the page information which was gathered for Human Genetics could not be correlated with the price information. The data for Current Advances in Plant Science and Clinical Immunology Newsletter could be only gathered back to 1981.[22]

B. Titles Included with Abbreviated Data

Given the data collection methodology, several titles have only partial data included. The lack of data was usually due either to a library's incomplete holdings or to the serial being off the shelf and at the bindery. The index approach to the price per page analysis, as indicated in the main text, yields a data series which can account for a changing sample size and focus on price trends and not absolute prices.

In the case of two titles:

Computer Fraud and Security Bulletin	Elsevier
Ocean Engineering	Pergamon

a few years' worth of data were not included since the particular data was inconsistent with the other data provided

---

22/ Actually 1980 data for Clinical Immunology Newsletter was obtained but it was definitely inconsistent with the latter years' data and could not be substantiated.

for the title and it could not be substantiated. Note that this issue arose in several other titles, but it was only for these two which the data could not be substantiated. Thus, even though ECS had data available for Computer Fraud and Security Bulletin for 1978-1987, only 1980-1987 was included in the analysis. Further, data was available on Ocean Engineering from 1973-1987, and only 1977-1987 was included in the analysis.

C. Page Adjustments

ECS has information on two titles which significantly changed their printing format during the time frame of this study. With the page format change, the information content per page (and hence value) will change. Therefore, a comparison of price per page given a changed format loses meaning. To account for this change in format an adjustment was made. The two titles:

Journal of Molecular Evolution	Springer-Verlag
Physics and Chemistry of Minerals	Springer-Verlag

changed formats between 1980 and 1981. For each journal, a sample set of pages was taken from both formats and compared for informational content. ECS approximated the number of words per page and adjusted the 1981 to 1987 page counts. The ECS estimates are that the new format for Journal of Molecular Evolution has 1.2 times the information as the old one, while the Physics and Chemistry of Minerals ratio is 2.4. We would welcome any information regarding other significant page format changes.

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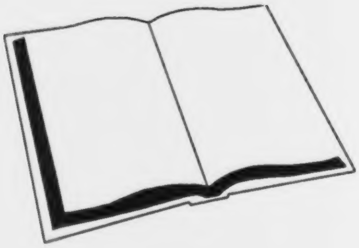
OF MAKING MANY BOOKS THERE IS NO END

Report on Serial Prices
for the
ASSOCIATION OF RESEARCH LIBRARIES



This is a contractor report prepared for the Association of Research Libraries (ARL). The views expressed in this report are those of the contractor and do not necessarily reflect the views or positions of the ARL Board or those of the ARL Membership.

Ann Okerson
Eastchester, New York
April 1989

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EXECUTIVE SUMMARY

The Association of Research Libraries commissioned this Report on Serials Prices in order to summarize the current debate within the research library community, define the precise problem, and propose a set of actions. The report places the current debate into the historical context of previous "serials crises" and shows the major threads of discussion within the current library literature.

ARL statistics on the collections of member libraries are used to show the impact of the present serials price problem on university library budgets. More money is being spent on fewer materials, resulting in less comprehensive collections. In view of the long time scale over which research libraries must plan and the basic goal of such institutions to preserve a comprehensive record of research, the current situation is a serious crisis. In addition, the current situation is also a crisis for scholarly publishers and the entire research community, since it threatens to overwhelm the serials publication system.

Three alternative views of the serials crisis are examined:

1. The Consumer Problem: libraries must learn to be vigilant consumers of high-priced materials, rather than passive archives of everything published;

2. The Systemic Problem: the current serials publishing system is strained to its limits, and significant changes are necessary to alleviate the problems;

3. The Economist's View of the Problem: academic serials represent a "natural monopoly" product, for which the high fixed costs and low (and inelastic) demand lead to very small circulations and high prices.

The possible solutions for the current crisis are implicit in these causes. This report proposes specific actions for ARL's consideration within three major recommendations:

Recommendation 1: Immediate Actions.

ARL should undertake a set of urgent actions to demonstrate the serious and immediate impact of the serials crisis. ARL should appoint a staff officer to actively lead its efforts with the university, government, and publishing communities.

Recommendation 2: The Role of Commercial Publishers.

ARL should strongly advocate the transfer of publication of research results from serials produced by commercial publishers to existing non-commercial channels. ARL should specifically encourage the creation of innovative non-profit alternatives to traditional commercial publishers.

Recommendation 3: The Quantity of Academic Publication.

ARL should strongly advocate that University administrations and granting agencies change their policies for judging promotion, tenure, and funding, so as to minimize current pressures for excessive publication. ARL should monitor the implementation of such changes and report the extent to which Universities and funding agencies participate.

CHAPTER 1 - INTRODUCTION & BACKGROUND

There is no new thing under the sun.

BACKGROUND OF THE SERIALS PROJECT

The ARL Serials Initiative forms part of a special campaign mounted by librarians in the 1980s against the high cost of serials subscriptions. This is not the first time that libraries have suffered from high serial prices. For example, in 1927 the Association of American Universities reported that:

> "Librarians are suffering because of the increasing volume of publications and rapidly rising prices. Of special concern is the much larger number of periodicals that are available and that members of the faculty consider essential to the successful conduct of their work. Many instances were found in which science departments were obligated to use all of their allotment for library purposes to purchase their periodical literature which was regarded as necessary for the work of the department." [1]

In the 1920s and '30s, prices of European, particularly German, scientific publications increased spectacularly. This inter-war surge, which was driven by hyperinflation of the Deutschmark and the unstable world political situation, pushed prices beyond many American libraries' ability to pay. The library and academic communities brought substantial pressure to bear on European publishers to correct the problem. This effort benefitted the American scientific community through continued access to serial publications from Germany, then a principal generator of scientific research. It has been suggested that the situation of the 1930s was directly analogous to today's, and that concerted action could have an equally salutary effect. [2]

After World War II, serial prices no longer dominated library concerns. However, enough interest remained for a group of dedicated librarians to begin the compilation of accurate information on periodical costs. Price indexes by subject category have been created each year since the base period 1947-49, and published regularly in the *Library Journal* since 1962. The American Library Association's Costs of Library Materials Index Committee assumed an early leadership in this activity. It has remained actively involved under its present name, the Library Materials Price Index Committee. [3]

During the 1960s, a robust economy and generous funding to higher education by successive administrations allowed library budgets and collections to grow rapidly. This growth established new expectations for library acquisitions and growth, and librarians were not greatly concerned about the cost of materials. The 1970s ended this pattern.

In 1971 the U.S. allowed its dollar to float, the economy faltered, and the growth of library appropriations slowed. Until that time, the cost of library materials and increases in subscription prices had aroused only little attention. Suddenly (1) because of variations in exchange rates, the cost of library materials was no longer as predictable as it had been, and (2) because of a slowed U.S. economy, European publications became relatively more expensive than they had been. It has not been easy for libraries to adjust their expectations and behavior.

For the purpose of this report, the term **serials** includes periodicals, newspapers, annuals, society publications, and numbered monographic series, as defined in the *ALA Glossary*, 1983.

Professional library literature from the 1970s shows concern for cost of materials, particularly periodicals, but focuses principally on effect rather than cause. Several articles lament high prices and discuss retrenchment and cancellation, which was the principal library response of the period. The problem was judged sufficiently serious to mandate two blue ribbon studies: first by Fry and White under the auspices of the National Science Foundation and the second, the Report of the National Enquiry on Scholarly Communication. Both studies concentrated on the reduction in funding for scholarly publishing and the impact on the dissemination of knowledge. Among the solutions proposed were subsidies to the scholarly information system, improvements in publisher production and marketing efficiencies, national bibliographic control, a national periodical lending library, and resource sharing. [4,5,6]

In the late 1970s and early 1980s, concern about costs of materials largely faded from library literature. The principal concerns turned to library automation, its high cost, impact on staffing and profound effect on general library philosophy.

The next wave of interest in serials costs was initiated by geographically-based periodical pricing. Some publishers began to charge substantially higher prices to customers outside their countries, much higher than could be explained by costs of distribution or maintaining a foreign marketing presence. This practice was particularly noticeable for some British publishers, who demanded sharply higher prices from North American customers. Many librarians and library organizations studied this practice without identifying any justifying cause for the price differential. [7,8,9,10]

These studies triggered an active interest in serials prices which has continued through the present. Powerful computing capabilities have facilitated detailed examination of materials prices, budget behavior, and spending patterns. Investigations of dual pricing practices strongly suggested that high subscription prices were not based solely on increased costs, but might also be attributed to predatory pricing strategy by publishers. Several examinations were conducted of price increases in relation to currency exchange rates, inflation, and journal size. As more librarians became aware of such problems, libraries began to act as alert and skeptical "consumers". This change has been accelerated by the U.S. and Canada's markedly conservative economic climate in the 1980s and increasing recognition of the interdependence of national economies and its effect on the academic environment.

CURRENT STATUS OF SERIAL PRICES ACTIVITIES

At present (Spring 1989), several important players dominate the discussion of serials prices:

1. Librarians, groups of librarians, and organizations have analyzed, by varying methods, the costs of serials by particular fields, publishers, disciplines, type, fund line, or other special criteria. Many of these studies have been widely publicized within the library community. These studies have generated sharp attention to what libraries are paying and encouraged a climate of consumer awareness. Library journals such as Library Issues and Serials Review routinely report on serials prices.

2. Library and scholarly organizations have become actively interested in serial prices. The American Library Association/Resources and Technical Services Division (RTSD) has created a Task Force on Economics and Availability of Library Materials (EALS) with representatives from several other associations and institutions, including the Association of College and Research Libraries, the American Association of Law Libraries, the Canadian Library Association, National Agricultural Library, National Library of Canada, National Library of Medicine, Special Libraries Association, and commercial firms.

The Task Force held its first hearings at the American Library Association annual midwinter meeting (1989).

A new Discussion Group on Journal Costs in Academic & Research Libraries was formed at this meeting. Several ALA sections, including RTSD, The Chief Collection Development Officers of Large Research Libraries Discussion Group, and Serials Section committees have specifically addressed prices.

The Collection Management and Development Committee of the Research Libraries Group (RLG) has outlined a possible way to deal, at least indirectly, with high prices through their Long-term Serial Project (LTSP), which is intended to maintain access to serial titles needed for advanced research with the goal of "protect(ing) the integrity of the consortial serials universe."[11] NASIG (North American Serials Interest Group) and SSP (Society for Scholarly Publishing) have sponsored special meetings on serial costs, as have various regional and local library and scholarly organizations.

3. Publishers of scholarly journals, from both the commercial and not-for-profit sector, have participated in many of these activities. They have presented papers and taken part in panels. Several learned societies have studied comparative journal costs within their disciplines (American Optical Society, American Chemical Society, American Mathematical Society[12]). Some learned society publishers have been performing such comparisons for some time (sometimes for internal distribution only), but without attracting much attention from the library community.

4. Several studies have been produced by academic researchers and faculty, rather than librarians.[13,14,15] Academics have appeared at library panels and conferences as end-users.

5. Recently, the serials problem has obtained wide public attention. For example, the New York Times devoted substantial articles to the subject on February 16th and September 5th, 1988.[16,17] The Wall Street Journal has mentioned serial prices.[18] The Chronicle of Higher Education has had continuing coverage of serial prices and related matters.

Several organizations have proposed major studies on the cost of serials and the generation and dissemination of scientific information. The Association of Learned & Professional Society Publishers in the U.K. will review the present scientific "information system" and its "economic flows" in light of present needs and anticipated future changes. This study is currently in its planning stages and is expected to take two to three years.

Utah State University began a study in August 1988 anticipated to be completed in Spring 1989. It covers approximately 1,000 locally held subscriptions in science and technology and is intended to satisfy the university's need for better management information about subscription continuance. In late 1989 the study will be expanded to include social sciences and humanities journals. The Utah State University study is particularly concerned with changes in journal pricing over time. It has chosen the period from 1967 to 1987 and collected detailed data for U.S., U.K., European, and other foreign publications. The intent of the study is explained as:

"The sample will include commercial, societal, institutional, university, and governmental publishers. Data will be collected to permit study of the following factors: price per volume, price per page, price per article, the presence or absence of page charges, the presence or absence of advertising, declining or expanding subscriptions, and the number of volumes published in a year. An attempt will also be made to assess price per line of type and price per character. These factors will be examined on a year by year basis."[19]

The Utah study has produced preliminary data, but has not released final conclusions. When available, this study will significantly improve understanding of the history and behavior of serial prices.

ARL INTEREST IN SERIALS PROJECT

The ARL Committee on Collection Development formally opened discussions of serial prices in its meetings of May 6th and October 21st, 1987. Its major concerns were the need to educate faculty, gather price data, examine intellectual property laws, and co-operate with friendly groups in the non-profit sector. ARL's attorney met with the Committee to discuss the legal issues involved. The ARL Newsletter of October 31, 1987 reported:

> "There is widespread agreement among ARL directors that the problem of rapidly rising serials prices is of such seriousness to the library community and to the community of scholars that ARL should consider a range of both short and long-term actions. These would be aimed at ensuring the flow of scholarly information within a rational economic environment -- an environment in which publishers earn a fair profit and libraries can afford to provide a full range of services and materials... These options [strategies identified by CCD for further consideration] ranged from public relations efforts to the promotion in alternative modes of publishing and distributing scholarly information." (pp. 1-2)

At the January 1988 CCD meeting in San Antonio, several possible ARL actions were identified, including:

- operating a clearinghouse on serial prices;
- serving as a strategic center for research library action, political or otherwise;
- collecting and distributing information;
- investigating legal action;
- cooperation with university presses;
- active participation in scholarly society meetings, such as the SSP.

ARL recognized that the serials price situation was sufficiently critical to justify special funding. (Summary Notes by Jeff Gardner, January 11, 1988.) A special assessment of $200 per member library was recommended to the ARL Board, in order to conduct a special project.

ARL defined a three-part project:

1. A briefing package containing narrative, statistical, analytical, and bibliographic information to be used to inform multiple library constituencies about the serious nature of the problems generated by high serials costs. This package was mailed to members at the end of August 1988 and is available from ARL for purchase by non-members.

2. An analytical project to produce a statistical analysis of increases in serials prices. This project would gather page counts and subscription prices over several years and compare them with currency fluctuations and publishers' production and distribution costs. Economic Consulting Services, Inc. (ECS) in Washington, D.C. was chosen to conduct the economic analysis, based on data gathered by ARL.

3. A report describing the extent of the problem caused for ARL libraries by serials prices and the causes of high prices. The report would propose recommendations for dealing with the problem.

EXPECTED CONTRIBUTIONS OF THE ARL EFFORT TO SERIALS PRICING

Given the large body of existing work on serials prices, and the large set of actors already involved, what unique contributions can the ARL effort make? Can it serve a function beyond that of preaching to the converted? The contributions are as follows:

1. This report synthesizes the prior thought, work, and writing on serials prices. Rather than merely identifying the problem, it specifically identifies realistic actions and recommendations.

2. The economists' study brings a perspective not previously available (although similar efforts are underway). Earlier studies have been conducted by librarians, scholars, or publishers rather than economists. The ECS study concentrates on four large publishers whose prices are felt to be especially problematic: Elsevier, Pergamon, Plenum, and Springer. It examines approximately 10% of the titles from these publishers from 1973, shortly after the U.S. dollar was allowed to float, to the present. ECS has created a publisher's cost model for scholarly journals based on the major cost categories of labor, typesetting, printing, paper, and distribution. This model is used to estimate the annual change in publisher's cost in the countries represented by the four publishers studied: Germany, The Netherlands, the U.K., and the U.S. ECS compares actual serial subscription price increases to modeled cost increases.

3. ARL expects to continue work on serials prices. Because the high cost of information has become critical for research libraries, ARL intends to support future extensions of the Serials Project. Previous attempts have not been pursued with determination. They have depended on libraries' perceptions of their financial well-being, and competed for attention with a variety of other concerns.

4. The ARL documents will have wide distribution to the academic and scholarly community beyond the 119 member libraries.

FOOTNOTES

(1) G. A. Works, "College and University Library Problems: a Study of a Selected Group of Institutions," prepared for the Association of American Universities, Chicago, American Library Association, 1927.

(2) Deana Astle and Charles Hamaker, "Journal Publishing: Pricing and Structural Issues in the 1930s and the 1980s," Advances in Serials Management, 2 (1988): 1-36.

(3) For a complete history of library price indexes, see Helen W. Tuttle, "Price Indexes, Library Materials," Encyclopedia of Library and Information Science, Vol. 23: 253-264. New York, Dekker, 1978 ed.

(4) Bernard M. Fry and Herbert S. White, "Impact of Economic Pressures on American Libraries and Their Decisions Concerning Scholarly and Research Journal Acquisition and Retention." Final Report, National Technical Information Service PB283874. Bloomington: Indiana University Graduate Library School, June 1978.

(5) Herbert S. White and Bernard M. Fry, "The Impact of Periodical Availability in Libraries on Individual and Library Subscription Placement and Cancellation." Final Report, National Technical Information Service PB 90111883. Bloomington: Indiana University Graduate Library School, December 1979.

(6) Scholarly Communication: The Report of the National Inquiry. Baltimore, Maryland, Johns Hopkins University Press, 1979.

(7) Larry X. Besant and Siegfried Ruschin, "Price of European Journals, Nature 310 (1984): 358.

(8) Siegfried Ruschin, "Why Are Foreign Subscription Rates Higher for American Libraries Than They Are for Subscribers Elsewhere?" Serials Librarian, 9 (Spring 1985): 7-17.

(9) Charles Hamaker and Deana Astle, "Recent Pricing Patterns in British Journal Publishing," Library Acquisitions: Practice and Theory 8 (1984): 225-32.

10) For a review of serial prices and problems between 1970 and 1985, see Ann Okerson, "Periodical Prices: A History and Discussion," Advances in Serials Management 1 (1984): 101-133.

(11) RLG, memo of 9/13/99 to CMDC from Sam Gowan and Annette Melville.

(12) As examples, see: "ACS Journals: Price Comparisons," American Chemical Society, Washington, DC, May 1988.

"Survey of American Research Journals," Notices of the American Mathematical Society, March 1986: 287-291.

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(13) Henry H. Barshall and J. R. Arrington, "The Cost of Physics Journals: A Survey," American Physical Society. Bulletin, 33 (1988): 1437-1447.

Henry H. Barschall, "The Cost-Effectiveness of Physics Journals," Physics Today, July 1988: 56-59.

(14) S. C. Abrahams and R. A. Matula, "Crystallographic Publishing in Retrospect and Prospect," Acta Crystallographica, 44(4) (1988): 401-410.

(15) Paul H. Ribbe, "Assessment of Prestige and Price of Professional Publications," American Minerologist, 73 (1988): 449-469.

(16) William J. Broad, "Science Can't Keep Up With Flood of New Journals," New York Times, February 16, 1988: C 1 & 11.

(17) Herbert Migtang, "American Libraries are in Crisis Over the Cost of Scholarly Journals," New York Times, September 5, 1988: E 11.

(18) Marion T. Reid, letter in The Wall Street Journal, November 24, 1987.

Joseph M. Queenan, "Major Investment Opportunity at Your Local Newsstand," The Wall Street Journal, September 28, 1987.

(19) Conversations and correspondence with Dr. Ken Marks, University Librarian, Merrill Library, Utah State University, January and February 1989.

CHAPTER 2 - DESCRIPTION OF THE PROBLEM FOR ARL LIBRARIES

For in much wisdom is much grief; and he that increaseth knowledge increaseth sorrow.

OVERALL IMPACT OF SERIAL PRICES ON BUDGETS AND COLLECTIONS

Is there a serials crisis in ARL libraries? Examination of year-by-year data says there is. ARL has annually compiled statistics describing, among other elements, the collections and materials expenditures of its member libraries for many years. For this report, statistics for the ARL university libraries from fiscal years 1971/72 to 1987/88 are used as a representative measure of serial collecting and prices. (The non-university libraries are not included in these figures because their data are highly unrepresentative; for example, to include the very large number of serials held by the Library of Congress would substantially skew the overall results.) For analysis in this report, 1971/72 was chosen as a starting date, corresponding with the U.S. government announcement on August 15, 1971, that the dollar would float against world currencies. Also, the ECS analysis starts with 1973 subscription prices set by the publishers in 1972.

For clarity, the conclusions drawn from these statistics will be presented in terms of *average* (mean) results. Examination of *median* results leads to similar conclusions. The data and calculations used in this section are shown in Appendix 1.

Figure 1 - Overall Library Expenditures and CPI

Total annual library expenditures have grown at a rate basically commensurate with the U.S. Consumer Price Index (CPI). (CPI figures used are taken from the *International Financial Statistics* of the International Monetary Fund.) Although the CPI is known to be an imperfect mechanism with which to gauge price growth, and other measures such as the Implicit Price Deflator might be preferred, the CPI provides a commonly-understood yardstick. We apologize to non-U.S. readers for the simplification of using a domestic U.S. measure of inflation. The Canadian experience, in particular, may be different in detail, but is probably similar in outline.

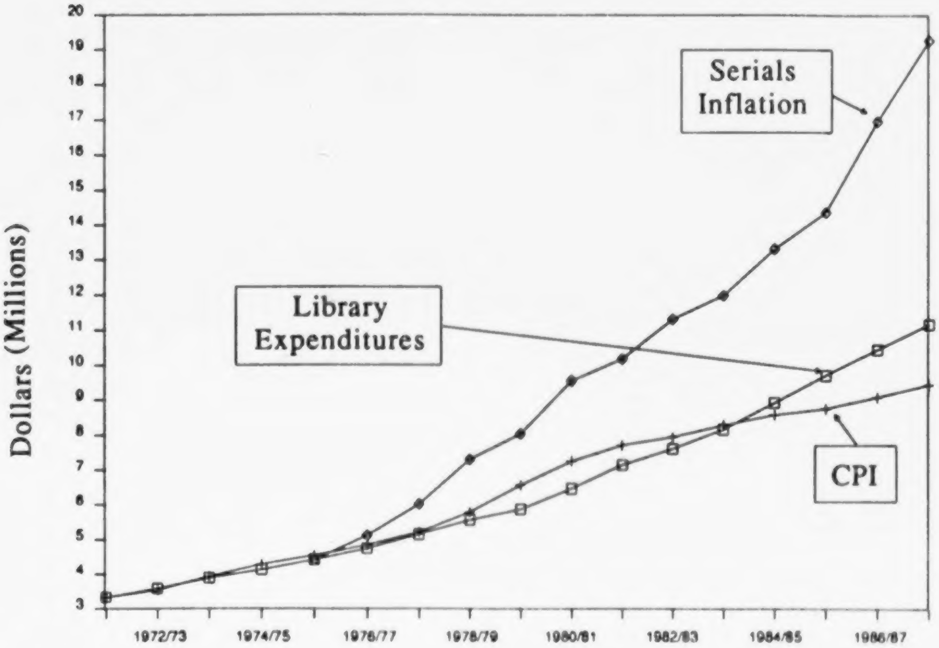
Over the period studied, the CPI has grown by 182.5%, while mean overall expenditures by ARL university libraries have grown by 234%. FIGURE 1 compares the rate of growth of mean total university library expenditures with CPI during the same period, 1971/72-1987/88. While the two curves are similar until 1983/84, since then library expenditures have grown at a more rapid rate than CPI. This suggests that ARL university libraries have been relatively successful in defending their budgets within their communities. FIGURE 1 also shows the average budget growth which would have occurred, had it grown at the same rate as serials expenditures.

Figure 2 - Library materials and Library Serials Expenditures

Mean library materials expenditures have grown as a proportion of mean total library expenditures, from 29.2% in 1971/72 to 33.1% in 1987/88. FIGURE 2 shows this modest rise in materials expenditures. It also shows the dramatic rise of expenditures for serials as a portion of the materials budget. In 1975/76 (the first year in which current serials expenditures were isolated in the ARL annual statistical reports), mean expenditures for current serials comprised 40.4% of mean materials expenditures. By 1987/88, that percentage increased to 56.2%.

Figure 1

Overall ARL Library Expenditures and CPI



This figure compares the actual growth of the average ARL total library expenditures with two alternate growth patterns:

CPI (INFLATION)

> The growth which would have occurred if average expenditures had grown at the same rate as the Consumer Price Index (CPI);

SERIALS INFLATION

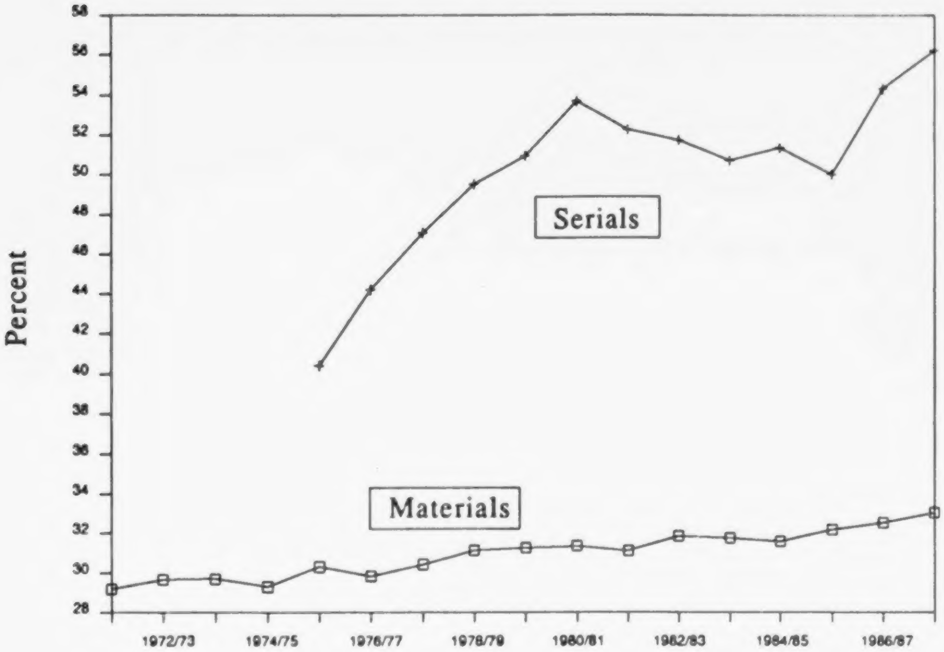
> The growth which would have occurred if average expenditures had grown at the same rate as average serials expenditures.

It shows that although the real average total budget has grown faster than would have been necessary to match the CPI, it would have needed to grow much faster in order to match the rate of growth of the average serials budget.

This figure dramatically illustrates that the proportion of the total library budget going to serials is increasing, or that in order to keep the serials budget a constant fraction of the total budget libraries would require a dramatic growth of total budgets. Note that this has occurred despite substantial efforts to cancel serials, as reflected in the leveling of the average serials numbers graph. Since serials expenditure figures are only available since 1975/76, the figure was generated using the actual 1975/76 average budget multiplied by the same growth seen each year for serials expenditures.

Figure 2

Library Materials and Serials Expenditures



This figure shows the proportion of average ARL total library expenditures going into materials, and the proportion of materials expenditures going into serials. The growth in the proportion going into materials is relatively slow, but significant. The growth in the proportion of materials budgets going into serials is substantial, although not monotonic.

Figure 3 - Average Serial Cost

From 1975/76 (when serial expenditures were first reported) to 1987/88, the average cost per serial in the ARL university library has risen from $21.54 to $75.18, or to 3 1/2 times its initial level. FIGURE 3 shows that the rate of increase has been especially steep over the last two years of the study, when the value of the dollar declined sharply.

It is important to note that beginning in 1985/86, the ARL annual statistics have divided serials into paid and unpaid categories, enabling a more precise calculation of average paid price; however, about 1/3 of university libraries have not provided paid/unpaid numbers, but only reported their total. Because of these limitations in the available data, and because materials which are free (or available through exchange) to some libraries may be paid for by others, all serials are included in this average cost.

ARL has, however, calculated average prices of purchased serials, which portray more dramatically the rise in prices, as follows:

1985/86	$87.47
1986/87	$102.49
1987/88	$115.05

These unit prices are substantially higher than the average serial prices determined from average total serials holdings divided into average total serials expenditures. Nonetheless, the percentage increases are similar, as would be expected if the percentage of unpaid serials in the population were constant.

By any measure, serials prices have increased remarkably. For historic perspective, the average subscription price paid by libraries during 1947-49 was $3.62. By 1960 the average price had increased to only $5.32. [1] Those statistics are taken from the American Library Association rather than from ARL reports.

Figure 4 - Growth in Number of Serials in ARL Libraries

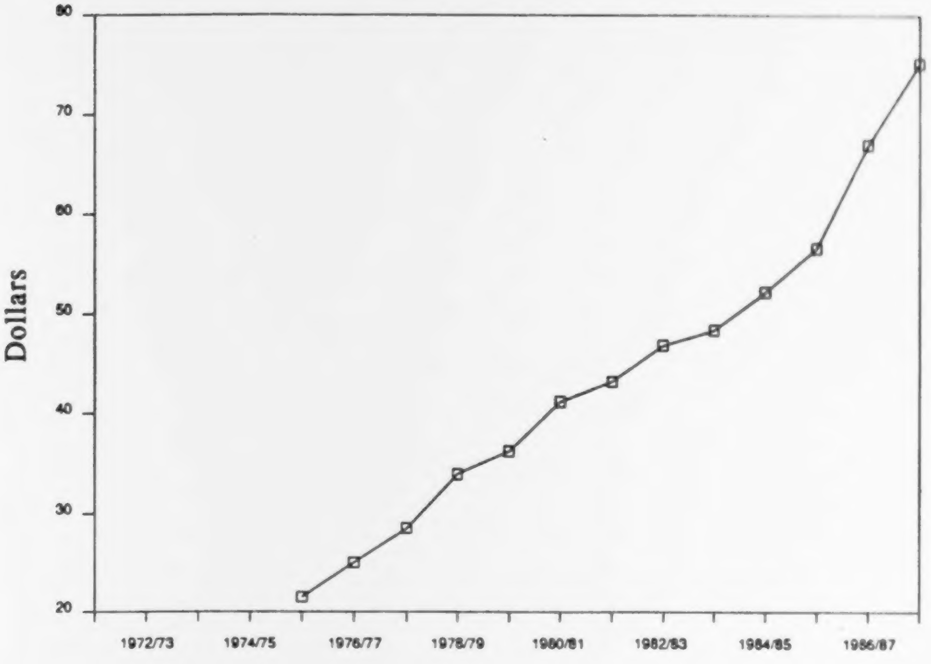
Figure 4 displays the rate of growth of the mean number of current serials in ARL university libraries (by titles, not volumes). The robust growth of the 1960s continued into the early 70s, after which it declined slightly, rose modestly, and then stagnated in the 1980s. Over the period 1971/72-1987/88, mean growth of serials was 29.6%, most of that in the first two years. Note that some caution should be used in judging the figures for the first three years (1971/72 - 1973/74), since they are the earliest years in which ARL collected details on total serials. Confusion occurred regarding serials and periodicals and total numbers were under-reported to ARL. For this report, and in subsequent years' figures, total serials specifically includes all forms of serials.

The average figures used in this chapter describe an ARL membership which has grown significantly during the 17 years studied. The number of university libraries rose from 78 to 107. The new members characteristically have smaller collections and budgets than earlier members, which causes average rates of growth to be somewhat smaller (more conservative) than for a fixed population. (See Appendix 1 for the specific data used to calculate the figures and graphs shown here.) However, the present method serves the purpose of describing as large (and representative) a population of libraries as possible, and the results are closely similar to available results for a fixed population of libraries.

The 1987/88 ARL Statistics studied a fixed population of 93 university libraries for the ten years 1978/79-1987/88. [2] The results achieved by calculating means for all university libraries (our Method 1) are

Figure 3

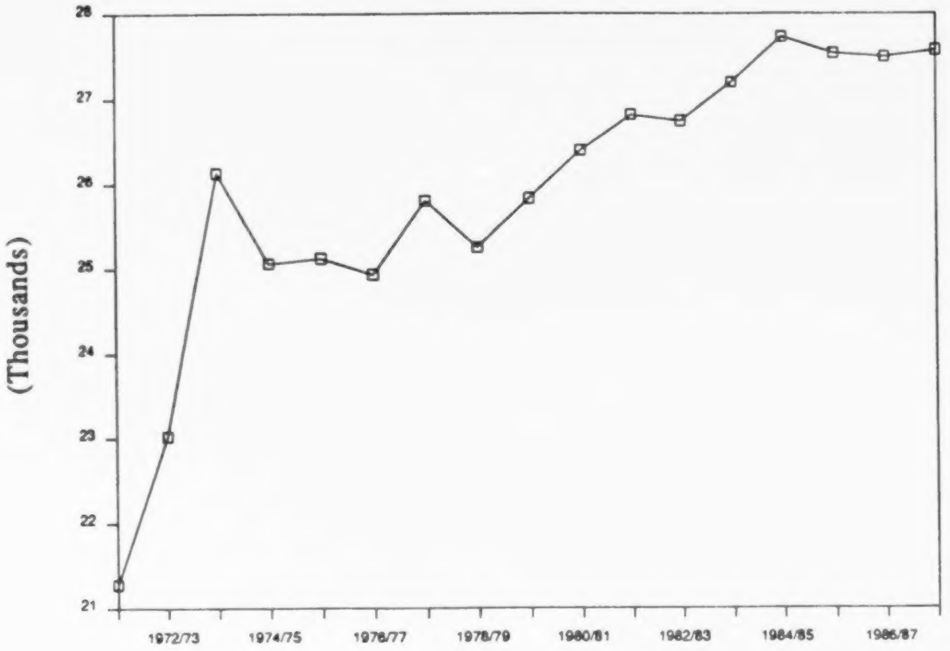
Average Serial Cost



This figure shows the growth in the average price of a single serial in ARL university libraries. Note that since total serial numbers are essentially static, it is the growth in prices rather than numbers which seems to explain serials budget growth. A partial explanation might be that serials cancellations have affected principally marginal, relatively lower cost serials, rather than the "critical" serials which may be higher in price.

Figure 4

Growth in Number of Serials



This figure shows the average number of serials in ARL university libraries. Over the last three years, the average number of serials has actually dropped. Since the number of libraries included in these figures changed by only one during these latter years, this drop is apparently significant.

substantially the same as the results obtained in tracking the fixed population (ARL Method 2). For example, during the ten-year period:

Total library expenditures:
Method 1: 100% increase
Method 2: 105% increase

Proportion of total library budget spent on materials purchases:
Method 1: 33.1% increase
Method 2: 33% increase

Overall increases in current serials expenditures:
Method 1: 141% increase
Method 2: 143% increase

Number of current serials:
Method 1: 9% increase
Method 2: 13% increase

Figure 5 - Serials vs. Monographic Purchases

FIGURE 5 shows trends in monographic and serials purchases in ARL university libraries over the period 1986-1988, showing how increased serials expenditures have directly affected the purchase of monographs. The additional funds to maintain serials collections have resulted in a decline of 15% in the number of monographs purchased.

Table 1 & Figure 6 - Serials "Universe"

The Bowker/Ulrich's serials database is the source of data in TABLE 1, which shows one estimate of how the serials "universe" has grown since 1971/72, from 70,000 titles to 108,590 at present.[3] FIGURE 6 graphs average ARL library serials holdings against growth of the serials universe, showing a substantial drop in percentage of titles collected in research libraries.

Table 2 & Figure 7 - Subscription Price Growth by Discipline

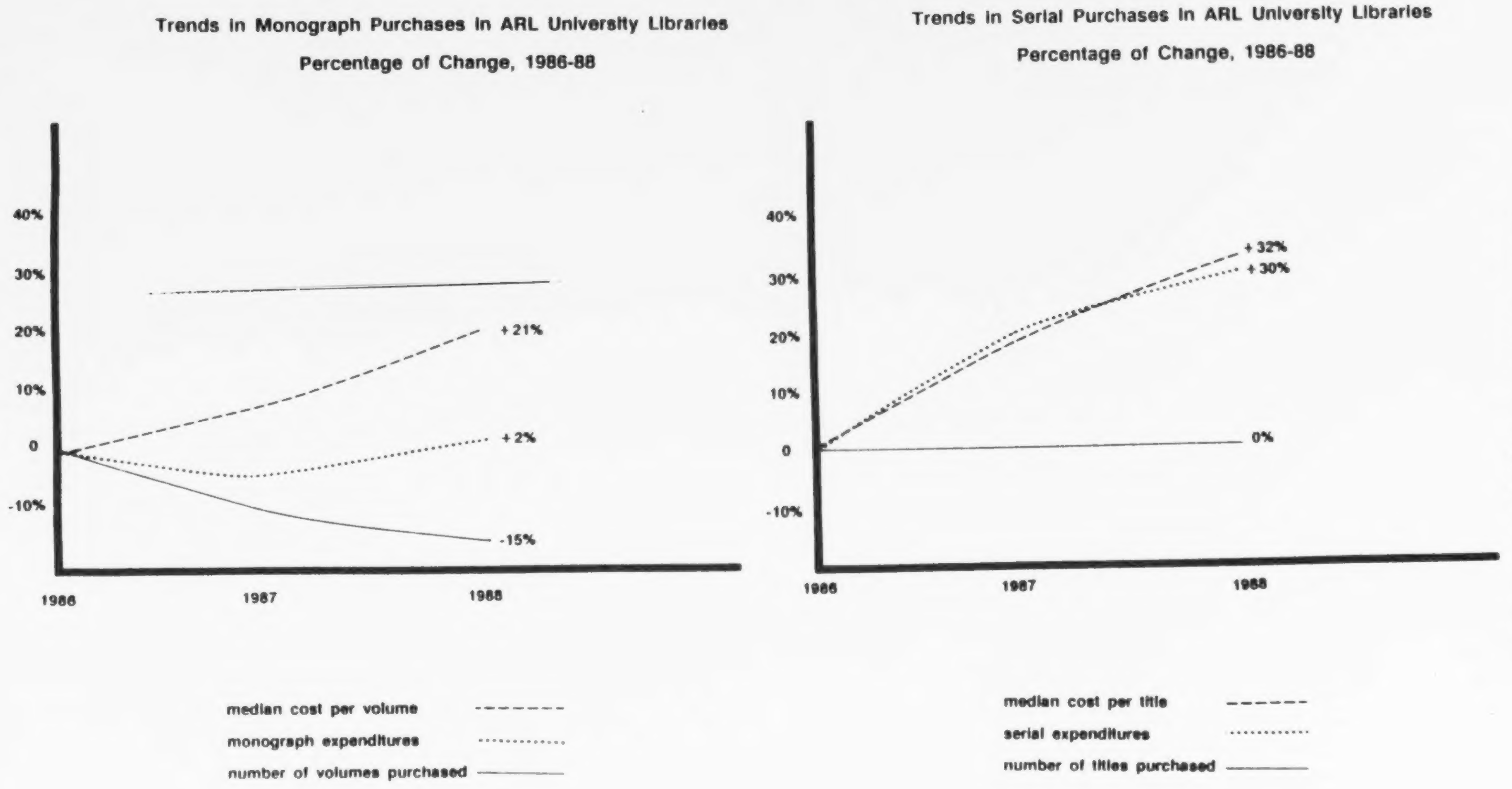
These data are taken from ALA's Library Materials Price Index Committee annual indexes and show average subscription prices by discipline in 1972 and 1988. They show that the highest prices are in Sciences, Technology, and Medicine, and that the disciplines with the highest prices, in general, demonstrate the highest rates of growth. It is in the sciences that the most severe part of the problem for libraries lies. (See also Appendix 2, Library Materials Price Index Committee data.)

INSTITUTION-SPECIFIC EXAMPLES

The average statistics describe the overall impact of high subscription prices on all ARL libraries: **more money spent on fewer materials and less comprehensive collections.** In addition, most ARL libraries have documented the specific effects on local budgets and collecting behavior. (At certain libraries the growth in the proportion of materials expenditures used for serials is dramatically higher than the average, particularly over

Figure 5

Serials versus Monographic Purchases


Trends in Monograph Purchases in ARL University Libraries
Percentage of Change, 1986-88

Trends in Serial Purchases in ARL University Libraries
Percentage of Change, 1986-88

source: Association of Research Libraries, 1987-88 *ARL Statistics* (Washington, D.C.: ARL, 1989)

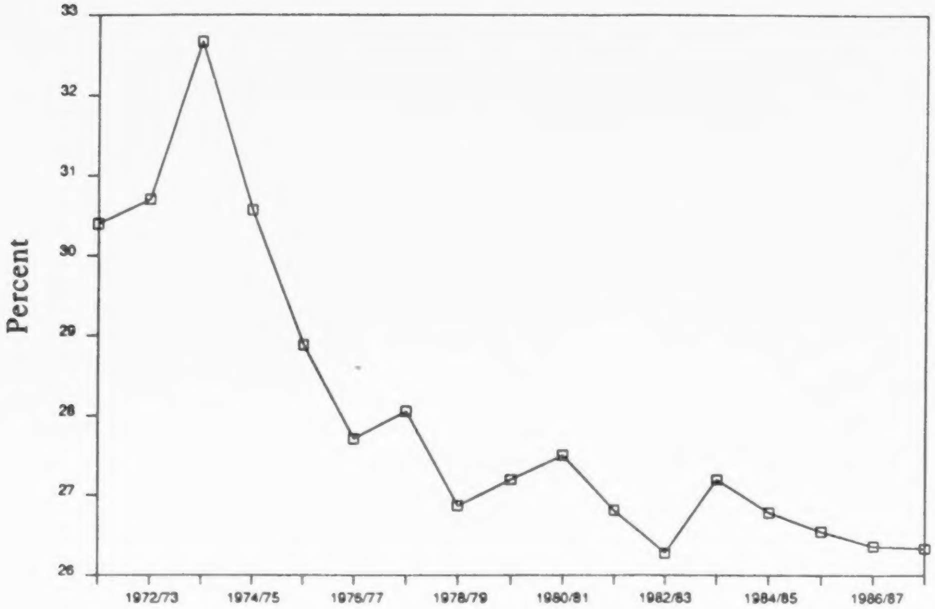
Table 1

Ulrich's Serials Universe

YEAR	ULRICH	IRREGULAR	BOTH	PERCENTAGE
1971/72	50000		70000	30
1972/73		20000	75000	31
1973/74	55000		80000	33
1974/75		25000	82000	31
1975/76	57000		87000	29
1976/77		30000	90000	28
1977/78	60000		92000	28
1978/79		32000	94000	27
1979/80	62000		95000	27
1980/81	63000	33000	96000	28
1981/82	65000	35000	100000	27
1982/83	64800	37000	101800	26
1983/84	66000	34000	100000	27
1984/85	69000	34500	103500	27
1985/86	68800	34900	103700	27
1986/87	68800	35500	104300	26
1987/88		35900	104700	26
1988/89	108590		108590	

Figure 6

Serials Universe



This figure shows the decreasing percentage of the complete (Ulrich's) serials universe (the sum of regular and irregular serials) represented by the average ARL university library serials holding.

Table 2

American Library Association
Library Materials Price Index Committee
Subject Categories in Rank Order

	CATEGORY	1988	RANK (88)	RANK (72)
	SOVIET TRANSLATIONS	$592.22	*	*
1	CHEMISTRY AND PHYSICS	$329.99	1	1
2	MEDICINE	$180.67	2	2
3	MATHEMATICS, ETC.	$159.33	3	3
4	ZOOLOGY	$127.33	4	4
5	ENGINEERING	$114.83	5	6
6	U.S. INCLUDING SOVIET	$105.45	6	8
7	PSYCHOLOGY	$100.57	7	5
8	U.S. OVERALL	$77.93	8	7
9	SOCIOLOGY AND ANTHROPOLOGY	$64.27	9	16
10	HOME ECONOMICS	$54.73	10	10
11	BUSINESS AND ECONOMICS	$53.89	11	11
12	JOURNALISM	$53.39	12	18
13	LIBRARY SCIENCE	$51.61	13	14
14	EDUCATION	$47.95	14	13
15	INDUSTRIAL ARTS	$44.20	15	17
16	LABOR AND INDUSTRIAL RELATIONS	$44.06	16	25
17	LAW	$43.33	17	9
18	POLITICAL SCIENCE	$41.55	18	19
19	AGRICULTURE	$33.56	19	24
20	FINE AND APPLIED ARTS	$32.43	20	20
21	HISTORY	$30.16	21	21
22	PHYSICAL EDUCATION	$28.60	22	15
23	GENERAL	$28.29	23	12
24	LITERATURE AND LANGUAGE	$28.04	24	22
25	PHILOSOPHY AND RELIGION	$27.09	25	23
26	CHILDRENS	$16.39	26	26

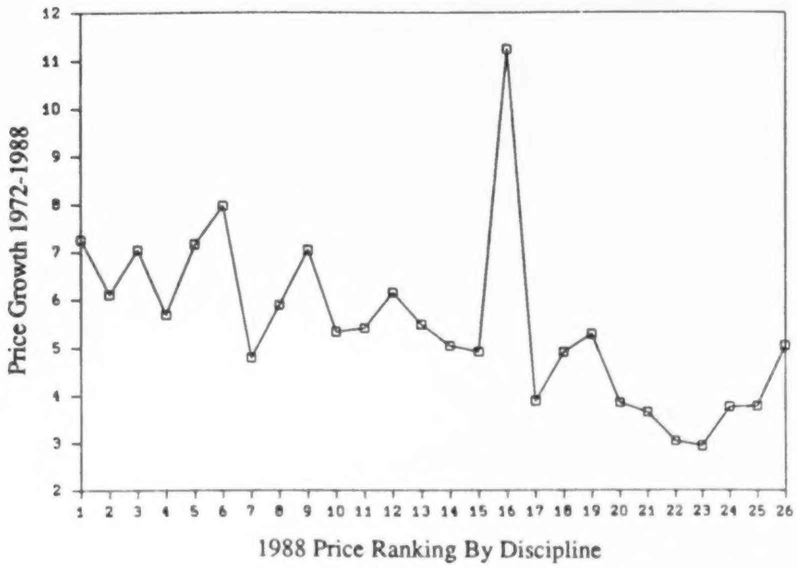
* Not separately indexed in 1972.

1972 Norman B. Brown, "Price Indexes for 1972: U.S. Periodicals and Serial Services," Library Journal July, 1972: 2355-57.

1988 Leslie C. Knapp and Rebecca T. Lenzini, "Price Index for 1988: U.S. Periodicals," Library Journal April 15, 1988: 35-41.

Figure 7

Price Ratio (Growth) Between 1972 - 1988
Against Relative Price Ranking by Discipline



This figure shows the growth of serials prices for various disciplines as a function of their respective price rankings shown in Table 2. With the notable exception of the extreme price growth observed in Labor and Industrial Relations (discipline 16) there is a very noticeable trend for the disciplines with high price rankings to also show high price growth. Although the differences in growth are not extreme, they accumulate over years. This figure also shows only the growth in price of existing titles; it does not show the effect of increasing numbers of titles in the high priced STM disciplines.

the recent past.) Serials price increases are outstripping the ability of even the wealthiest institutions to afford them. Rapidly rising serials prices have caused libraries to request additional funding and/or to cut many subscriptions. Some examples of cutbacks:

1. In 1987/88, Stanford University required an additional $300,000 in order to fund commitments to library acquisitions. Most of the infusion of extra funds was required because of the rapidly rising cost of science journals, although the impact of unexpected exchange rates was also a factor. This "special" money was not added to the budget base. A major serials cancellation program was initiated, which cut 400-500 subscriptions to save approximately $100,000. Such cuts are projected to continue in fiscal year 1989/90, involving a further $200,000 reduction in sciences acquisitions funds.[4]

2. In order to stay within its 1987/88 budget, the University of California, Irvine, Library cancelled 1,192 journal titles to save $187,705. At the same time, monograph acquisitions also had to be cut substantially. The percentage of library materials funds spent on serials subscriptions increased dramatically. The library attributes this situation to a static budget, the dramatic rise in subscription prices, and the consequent decrease in the purchasing power of the materials budget. Increases in the price of sciences journals are accorded a large share of the blame.[5]

3. In 1986/87, the University of Toronto Library cancelled 1503 serial titles with a total cost of $265,320 Canadian dollars. A combination of rising serial costs and adverse currency exchange rate fluctuations for all of the major foreign sources made this reduction necessary. Since the reduction, a zero growth policy for new serial purchases has been applied wherein a cancellation of equal cost must be made before a new title can be acquired.[6]

4. The Middle America State Universities' Association (MASUA) libraries, 8 of whose 9 members are ARL libraries, reported approximately 7% drop in purchased serials subscriptions from 1984/85 to 1987/88. In spite of cancellations, the average number of monographs purchased has dropped by approximately 26%.[7]

5. University of Illinois at Urbana-Champaign libraries cancelled 4,434 serials titles between September 1986 and November 1988, to save $438,057.[8]

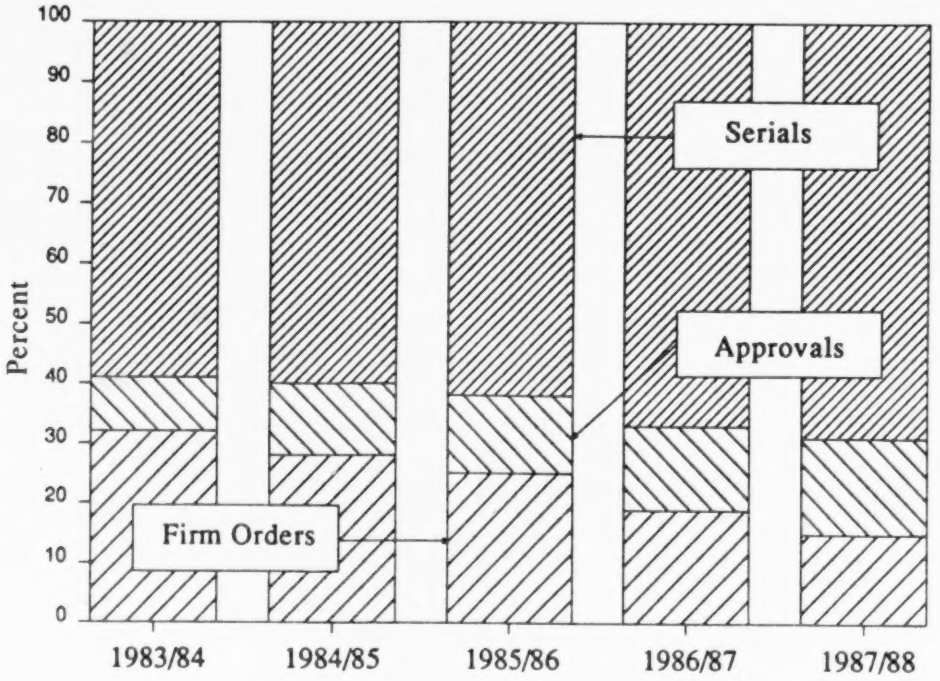
6. Similar problems at Harvard, University of California (Berkeley), and University of California (Santa Barbara) have been described.[9] FIGURE 8 describes the impact of increased serials expenditures at the University of California at Berkeley. Were present trends to continue, the library would be spending all its materials budget on serials before the end of the century. This situation arises in spite of active serials review and cancellation programs.[10]

SOME EFFECTS OF SERIALS PRICE INCREASES IN ARL LIBRARIES

1. **Using resources allocated to other library budget lines.** Libraries have frequently been forced to use non-serials budget lines to pay for current serials. Not only have other materials budgets been affected (as shown in figure 5), but in some cases budget balancing has required funds from more distant areas, such as binding and preservation. Such disruption of the normal budgeting process is not strictly recorded in the ARL statistics, but can be inferred from them; several specific libraries have published their occurrence.

Figure 8

Impact of Increased Serial Prices on Other Materials
At University of California, Berkeley



This figure shows the change observed at the University of California, Berkeley, library of the percentage of total materials expenditures on serials, approvals, and firm orders. Firm orders have dropped by over half, while serials and approvals have increased substantially. The change in firm orders and approvals probably corresponds to a tactic for reducing the library labor involved in acquisitions.

The change in serials expenditures is extraordinary: they have increased by 10% in 4 years. If this rate of increase were continued linearly, the entire materials budget would be used for serials in only 12 years.

2. **Requesting supplementary university funds.** For years during which price increases were particularly dramatic, some libraries have been unable to operate within allocated budgets. They have had to request supplementary allocations (bailouts) from university administrations. Such special funding is not normally easy to find and disrupts other university priorities.

3. **Additional uncertainty in budgeting.** The effect on both libraries and institutions exacerbates the problem of orderly budgeting. Library budgeting is already problematical, in part because subscription payment cycles and institutional budget years are not synchronized. (Renewal invoices are often received between August and December, while institutional budgets typically span mid-year to mid-year, and some institutions operate on two-year budget cycles). Budget requests must usually be submitted months in advance of a new fiscal year, long before publishers announce new subscription rates or applicable exchange rates are known.

4. **Subscription freezes and cancellations.** When libraries experience an unexpected budget shortfall, due to unanticipated exchange rates and/or price increases, and special bailout funds are unavailable, emergency tactics are necessary. One such tactic is to freeze new subscriptions, so that desired titles cannot be added to library collections. Another tactic is cancellation to stay within budget. When time allows an orderly cancellation plan, decisions can be based on use studies, faculty consultation, and citation analysis. When emergency cancellation is necessary, serials may be chosen for cancellation primarily in order to free funds. For either freeze or cancellation tactics, subsequent re-instatement (should it be desired) is possible, but it may be difficult to replace missed volumes, since they go out of print quickly. Both cancellation and re-instatement require as much (or more) labor as initial subscription placement.

5. **More rapid increase in subscription prices.** Subscription cancellations reduce a serial's subscriber base. Logic dictates (and a number of publishers say) that such reduction increases subscription price even further.

6. **Reduction in monographic printing and purchasing.** The increases in serial prices appear to have affected other areas of research publishing, such as monograph prices and print runs. Several monograph publishers have stated that they must increasingly recover their costs on smaller press runs; this increases monograph prices.

7. **Library collections and budgets unbalanced among disciplines.** Since serial price increases have been particularly large in sciences, library budgets for social sciences and humanities have been affected by the price of serials outside their disciplines. Collections are becoming biased (at least in budget percentage) toward sciences; it is unclear how to achieve balance and fair support for all disciplines. Thus, libraries risk future, if not present, loss of richness and diversity in collections. An atmosphere in which each discipline "rushes for the lifeboat" carries the danger that not only serials, but entire library collections, might begin to excessively reflect the limited interests of more powerful faculties or individuals. Titles cancelled or never purchased may be less well-known or fashionable, an effective denial of outlets to young scholars or unpopular ideas.

8. **Impact on service goals of research libraries.** Librarians are concerned about the damaging effect of serials prices on the effectiveness and mission of research libraries. The mission of libraries is to assure the accessibility of information, particularly for local needs. ARL libraries have the stated, unique objective of ensuring that information is preserved and transmitted through generations, for scholars, as well as for education and research in general. Historically this has been interpreted as maintaining an archive of published research results or the "body of knowledge." Even in the sciences, where research progresses very rapidly, such an archive is necessary for many reasons: recording accepted results, providing access for students, and allowing multiple researchers to benefit from the re-use of data previously acquired. The high cost of serials erodes librarians' ability to achieve this goal.

9. **Concern for the future of serials publishing and dissemination.** The situation is sufficiently serious to cause concern about the serials system, which has historically been the principal means of reporting the results of new research. There is currently no realistic alternative means of reporting which is as orderly, tidy, or bibliographically controlled. New technology offers some possible solutions, but none are ready for immediate use, because of high costs, unpredictable prices, rapid change, dependence on expensive equipment, demands for user sophistication, and problems of bibliographic control and access. New methods for research reporting will require new rules and new behavior for both librarians, authors, and readers, which are neither defined nor trivial to develop.

FOOTNOTES

(1) Frank L. Schick and William H. Kurth, "The Cost of Library Materials: Price Trends of Publications," U.S. Office of Education, OE-15029A, October 1961.

(2) Kendon Stubbs, in the introduction to ARL Statistics, 1987-88, Washington, D.C., 1989, pp. 7-8.

(3) Data for Table 1 supplied by staff at Ulrich's, Serials Bibliography Department, combining the periodicals & irregulars/annuals files.

(4) Conversation with Michael Ryan, Director of Library Collections, Stanford University, 2/16/89).

(5) UCI Library Update, Special Issue, Fall 1988, p. 1.

(6) Correspondence with Gayle Garlock, Assistant Director for Collections Development, University of Toronto, 2/89.

(7) Correspondence with Kent Hendrickson, Dean of Libraries, University of Nebraska-Lincoln, 3/89.

(8) Conversation with Carl Deal, Assistant Director for Collections, University of Illinois-Urbana, 2/89.

(9) Constance Holden, "Libraries Stunned by Journal Price Increases," Science, 236 (May 22, 1987): 908-909.

(10) From an overhead presented by Joseph Barker, Head of Acquisitions Department, University of California at Berkeley Libraries, at the Charleston Conference, November 5, 1988.

CHAPTER 3 - CAUSES OF THE SERIALS CRISIS

The stream of literature has swollen into a torrent -- augmented into a river -- expanded into a sea.
Washington Irving, 1819

The problem of high serials prices can be viewed in three ways:

1. As **a consumer problem**, with at least some publishers overcharging inadequately vigilant librarians for publications which libraries and scholars believe ought to be acquired to support education, scholarship and research.

2. As **a systemic problem**, with the mechanism of scholarly dissemination (essentially paper publishing) strained beyond its capacity because of the tremendous increase in research reports. These are largely of academic origin, because publication is a "necessary" product of academic research. The use of publication quantity as a principal method to judge performance for academic tenure and research grants exacerbates the growth. The result is publications too numerous to read and increasingly difficult to referee, which may reduce the quality of papers published. (Interestingly, some advocates of the "consumer" explanation also advance the "systemic" argument. The position is precarious, since it suggests continuing to collect materials simultaneously described as dubious in content and seldom used.)

3. As **a classic economic problem** of "natural monopoly", in which the combination of high fixed costs of producing a serial and low marginal production costs for additional units, together with the low elasticity of demand for library acquisition of serials, leads to very high prices and total circulations far below economically optimal levels.

The causes for high serial prices include a combination of all three factors. In order to find a solution, all of the groups involved must participate: librarians, scholars, publishers, learned societies, academic administrators, funding agencies, and government.

THE CONSUMER ARGUMENT

The consumer argument places the blame for the rapid rise in serials prices largely on librarians who have too often accepted without serious complaint whatever prices publishers set for serials. This argument suggests that vigilance on the part of librarians will cure the present problem of high prices.

Although librarians have been negligent or uninformed consumers, this behavior is quickly changing. Growing consumer awareness has generated an avalanche of studies in several areas, for example: dual pricing, the effect of foreign exchange rates, privatization, publisher concentration, comparison of annual serials price increases with common measures of inflation, such as the Consumer Price Index, and cost of society versus commercial publishers' serials.

I. Dual Pricing

Several types of dual journal subscription pricing exist:

- Institutional versus individual subscriptions.
- Institutional versus (individual) member subscriptions (generally practiced by societies).
- Perceived use pricing, in which a higher subscription price for an indexing or abstracting service is charged to a library holding a greater number of the indexed journals.
- Document delivery pricing (the sale of single articles rather than the complete journal).
- Higher prices for libraries outside the country of publication (geographically-based dual pricing).

It is principally the last form of dual pricing which has incensed librarians, though not in all instances. There has been little quarrel with slightly higher U.S. prices to allow the foreign publisher to maintain U.S. offices and distribution. Where additional service is provided, this is judged fair compensation for a higher cost of providing such service. The outcry has been caused by what appear to be exorbitant differentials. Some publishers have made substantial efforts to enforce a ban on "buying round," to stop U.S. libraries from purchasing foreign subscriptions through subscription agencies in their country of publication and paying that country's prices. Certain publishers have required that subscription agents report the name and location of the end-subscriber so that the higher price is sure to be charged.

The problems caused by dual pricing were documented in the early 1980s as the dollar started to slide against the British pound and other major currencies. Otto Harrassowitz, a German academic bookseller, informed customers about the price-discriminatory behavior of a specific publisher. Widespread attention to dual pricing was also brought by librarians at Linda Hall Library and at the University of Missouri libraries. At the June 1984 American Library Association annual conference in Dallas, the Resources and Technical Services Board passed a resolution to "ask that British periodical publishers establish more equitable subscription rates for U.S. libraries." (Appendix 2)

The origins of geographically-based dual pricing appear to be linked to the abandonment of fixed exchange rates. After 1971, many foreign publishers began to quote subscription prices to North American subscribers in U.S. dollars at prevailing exchange rates. Increased local prices resulted in commensurately increased dollar prices. This practice worked well as long as currency exchange rates were reasonably stable. However, between 1979 and 1981, the U.S. dollar rose sharply against the British pound (and other currencies). Many British publishers (as well as other British manufacturers) chose not to lower their U.S. prices accordingly, but rather continued to raise them. The evident intent was to increase the profitability of North American sales, while hiding the increases within the expectation of inflation. When the relative dollar exchange rate dropped later in the 1980s, these publishers chose not to give up their higher profit levels, but further raised their prices. (Note that this behavior was substantially different from that of other foreign manufacturers, such as Japanese automobile companies.) The differentials have grown to unacceptable levels.

A detailed pricing study of 17 British publishers in 1974 [1] demonstrated that for the 548 titles covered, North American libraries paid a two-thirds premium compared to U.K. subscribers and one-third more than other overseas librarians. These prices implied effective exchange rates that were completely unrealistic, as high as $3.20 per pound when the true rate was $1.30 U.S. to the pound. Publishers set subscription prices well in advance of the beginning of publication year, and must include exchange rate risk if they price in foreign currency. However, exchange risk could not explain such a large difference between the implied and actual exchange rate.

Another study examined prices of 108 of the above 548 titles, from 7 major British publishers, and determined that "high prices and price differentials correlate with high indicators of value and use." That is, publishers appeared to be charging more for more prestigious, highly read journals, as much as the market would bear. [2]

An updated study in 1986 showed that North American libraries were paying 39.3% more than U.K. libraries and 18.5% more than other overseas libraries, a partial reduction. Despite this reduction, dual pricing remains an irritating factor for a substantial number of British and, more recently, a few other foreign journal publishers. It is worth noting that the reduction in differential did not come from price reduction in the U.S., but from high price increases for local subscribers. [3]

II. Foreign Exchange

The reduction in geographically-based price discrimination against U.S. libraries in 1985 was associated with a dramatic slide in the value of the dollar against major foreign currencies. This dollar decline particularly affected publishers from three countries containing major scholarly and academic publishers: The Netherlands, the U.K., and West Germany. FIGURE 9, "Strength of Dollar," charts the value of the U.S. dollar relative to several critical currencies over time and shows the uncertainty caused by changes in dollar value. [4]

Academic and research libraries spend as much as 60% [5] of their materials budgets on non-U.S. materials. The foreign materials are not arcane, but rather titles from important publishers containing critical research reports, many of which originate in the U.S. In the sciences particularly, scholarship is increasingly international. As evidence, a 1988 National Science Foundation study shows that between 1974 and 1984 references by U.S. scientists to articles by non-U.S. authors increased from 38,450 to 321,681; articles with international co- authorship nearly tripled. The fields in which co-authorship is most common are Earth and Space Sciences, Mathematics, and Physics. Out of 369,930 periodical articles in the sciences, only 131,111 are produced in the United States. [6] In the Institute for Scientific Information (ISI) database, 60% of authors have non-U.S. addresses and 50% of publishers are non-U.S. [7]

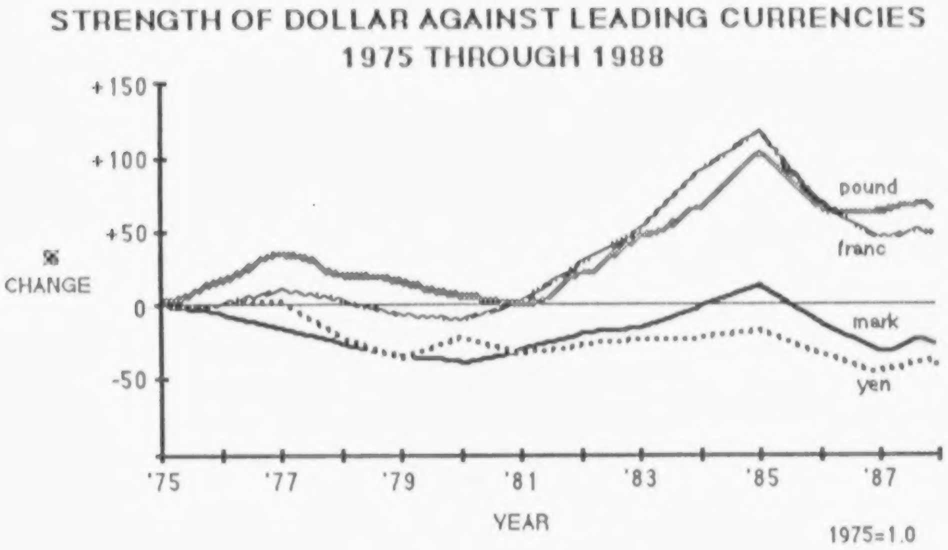
Although the global nature of the information world is particularly apparent in science, it is evident across most research fields. In the future, libraries must expect to be asked to provide more and more material from a global, rather than a national information stream. This development is highly beneficial for the progress of research, but complicates the job of materials acquisition and increases the vulnerability of library budgets to exchange rate variations.

Those libraries which must particularly include foreign serials in their collection have suffered extraordinary increases because of the decline in value of the dollar. Data collected by a large library subscription agency show the rate of price increases for academic libraries in 1987 was 13.4%, almost double that for 1986. This change was due largely to the fall of the dollar against foreign currencies. The increase for foreign serials was 17%. The greatest increases occurred for serials originating in Austria, Japan, The Netherlands, Switzerland, and West Germany. [8]

Exchange rate fluctuations provide libraries periods of greater buying power alternating with periods of lesser buying power. The recent cycles have been especially dramatic in their peaks and lows. [9] During periods of a strong dollar, libraries initiate more buying, making up for lean years and aspiring to a "universal collecting" behavior. They may also relax their vigilance as consumers. In periods of dollar weakness, whose onset may be sudden, it is difficult to contract expectations and change behavior. Unlike the purchase of automobiles or electronic equipment, purchases of serials cannot be deferred until a better budget year; the subscription marches forward inexorably. Unlike many imported goods, domestically produced library serials cannot be easily substituted for foreign scholarly publications. The different serials are not directly interchangeable; librarians and scholars believe that they need both domestic and foreign journals.

Recent U.S. government fiscal policy has encouraged the devaluation of the dollar in order to make U.S. produced goods more competitive abroad, thus stimulating domestic manufacturers. Record U.S. trade and

Figure 9


STRENGTH OF DOLLAR AGAINST LEADING CURRENCIES
1975 THROUGH 1988

Note: Based on New York bank prices quoted on the last day of each year.

budget deficits have caused currency traders to regard the value of the dollar with skepticism, contributing to its decline. The dollar's future is unclear; the new administration may continue recent policies. Some experts predict that the decline in the value of the dollar will continue for several years.

Recognizing the damaging effect of falling U.S. exchange rates on American libraries, the ALA Resources and Technical Services Division passed a resolution in June 1987 at its annual summer conference in San Francisco, calling the matter to national attention (Appendix 3). This resolution is a particular example of an attempt by the library profession to extend its consumer activism into the political arena.

III. Government Privatization Policy

Research libraries collect substantial amounts of government information published in serials form. Government information, which is collected or created with tax dollars, is distributed in a wide variety of formats, including serials, through several channels: by the government itself (GPO, NTIS, Statistics Canada and individual agencies...), by commercial or non-profit information companies, and by libraries. Recent U.S. administration policy has attempted to reduce government agency budgets, to achieve full cost recovery for many government services, and to transfer many activities previously performed by the government to the private sector. While closely related, fiscal savings and privatization are separate pressures. Even if the government's privatization policy changes, the pressure to reduce government agency budgets will continue to affect the availability of government information.

Many government publications that were previously published at or below cost have been transferred to commercial publishers. The price of these materials has increased substantially. Since government information is by definition in the public domain and not subject to copyright, commercial publishers have obtained highly unusual arrangements, in which federal agencies have effectively given exclusive control of the information to private interests.

The U.S. government is rapidly increasing the dissemination of public information in electronic instead of paper formats. Paper formats are projected to decline slowly, while electronic formats (bulletin boards, floppy disks, compact optical disks, desktop publishing...) will increase dramatically. [10] Government databases from the private sector are much higher priced than those from government agencies. Testimony before Congress on NTIS reported that privatization of government databases more than doubled the price to the user (Harold B. Shill, West Virginia University). A Federal Elections Commission database was available from the agency for $22 an hour or $1000 a month for unlimited access. Under a contract with a commercial firm, the information was available for $4000 a year for unlimited access, a serious barrier for occasional users. [11]

The U.S. Office of Management and Budget (OMB) pressure to privatize the Department of Commerce's National Technical Information Service (NTIS) was stopped by Congressional action in 1988 when librarians and others argued that the sci-tech clearinghouse functions performed by NTIS were inherently governmental and should be maintained as a government function. Librarians and other concerned parties have been active in campaigning against such kinds of behavior but only partially successful in alleviating such pressures.

IV. Concentration of Key and Expensive Journals Within Certain Publishing Companies

The publication of certain key scientific and technical serials is becoming increasingly concentrated in the hands of a small group of publishers. More of the money spent on academic library subscriptions is going to fewer publishers, particularly the major European international publishers: Elsevier (The Netherlands), Pergamon (U.K.), and Springer (West Germany). These three publishers together produce nearly 1300 journals, principally in scientific and technical areas. Many of their titles are leaders in their fields. This concentration has resulted in pricing behavior that borders on monopolistic or oligopolistic, as some major journals grow apparently unfettered in price and size.

As specific examples:

- Louisiana State University found that 20% of their subscriptions account for 72% of serials costs. [12] Elsevier, Pergamon, and Springer together absorbed 43% of the increase in Louisiana State University's serials expenditures for 1987. Although their serials comprised only 2.5% of paid subscriptions, their costs consumed 20% of all serial funds. [13] LSU librarians have argued that these major publishers increasingly dominate research library budgets, [14] and other institutions report the same phenomenon.[15] These titles are affecting libraries' efforts to collect anything else.

- Another LSU study discovered that comparatively few titles accounted for a majority of price increases from 1981-1987. The study determined that for Elsevier, Pergamon, and Springer, less than 6 percent of titles constituted the top quarter of total price increases. [16]

- At Yale University, Elsevier published .4% of titles held but absorbed 3.5% of costs. [17]

- At the University of Michigan, the total paid to Elsevier, Pergamon and Springer comprised 16.1% of the subscriptions budget. [18]

- The general pattern discovered at several university libraries is that approximately 10% of all titles in the $150 plus range account for as much as 50% of serial subscriptions costs. [19]

The major international publishers have been accused of acting like a cartel. The current serials price problem has been compared with the recent oil crisis, with possible economic impacts at least as great for libraries. One strong library advocate states that if prices continue to increase at their recent rate, the system of scholarly communication through serials will collapse. It may be necessary to implement an accelerated search for alternative means of publishing and sharing information, just as was done to attempt to find alternatives to oil consumption. [20]

V. Publisher Increases Far In Excess of General Inflation and Consumer Price Index

The Library Materials Price Index Committee's (LMPIC) 28th annual survey of U.S. periodical prices for 1988, compares recent increases in the U.S. Consumer Price Index (CPI) with increases in subscription prices for domestic periodicals. In 1987, the CPI increased 3.7%, while subscription prices increased 9.9%, or 2.67 times as rapidly. [21] Foreign serial prices increased by 17%, 4.59 times the CPI.

Clearly, serials prices are affected by factors in addition to general inflation. Some of the explanations offered are:

1. **Production costs**, including editing, labor, and paper have risen more rapidly than inflation. (Paper costs rose particularly sharply in the early 1980s.) The cost of processing manuscripts has gone up as the number of papers submitted has risen. At the Charleston Conference in November, 1987, Jolanda von Hagen, President and CEO of Springer Verlag, New York, indicated that some university editors of scientific journals might be receiving as much as $20,000 per year in compensation. [22] This cost is in addition to salaries paid to regular members of the publisher's production and editorial staff (and in addition to the editors' institutional salaries). It has been suggested in other forums that academic editors and board members receive additional indirect

compensation, such as research and conference travel. These perquisites may be publishers' responses to an increasingly competitive environment for prestigious editors of scholarly journals.

Published literature reveals very little about the precise breakdown of publisher costs in journal production. However, in its study for ARL, ECS has attempted to determine percentages for various associated factors.

2. **Rapid growth** in the size of journals, particularly scientific journals, has increased the subscription price. For example, The International Journal of Mineral Processing published 409 pages in 1978 and 1086 pages in 1988. The Journal of Chemical Ecology increased from 734 pages in 1978 to 2188 pages in 1987. Applied Physics Letters published 1600 pages in 1977 and 4300 in 1987. The total number of papers published in the International Union of Crystallography journals increased from about 100 in 1950 to nearly 1400 in 1985.[23] The Journal of Physical Chemistry increased from 5,000 pages in 1982 to 7,000 in 1986. Obviously, such growth carries a corresponding price tag.

Criticism of such proliferation in size implies that editors should reject more papers, in order to improve quality as well as keep prices down. However, high rejection rates may not prevent journal growth. For example, Physical Review Letters, which has one of the highest rejection rates of any physics journal, has more than doubled its size in the past decade.[24] Journal growth reflects increases in the demand for publication of scientific papers.

3. **A greater degree of specialization** leads to the creation of new journals, or "twigging," in which an existing journal is split into several. The new journals often appeal to an even smaller market than their parent, increasing their price.

It is interesting to observe that the trend toward "interdisciplinary" research, in which new fields bridge the traditional boundaries between classic subject areas, has not arrested this specialization. In fact, "interdisciplinary" journals may well be considered another example of specialization. No matter how genuine the desire for breadth and interdisciplinary coverage, the sheer volume of modern knowledge makes the ideal of encyclopedic completeness unobtainable.

4. Publishers contend that **photocopying, electronic transmission of information, library resource sharing, and budget cutbacks** have tended to reduce the number of individual and institutional subscriptions. This erodes serials' subscriber base and publishers' revenues. For example, total circulation of American Chemical Society journals fell from 119,827 in 1969 to 86,082 in 1982. The American Institute of Physics reported that its subscriptions have decreased by 2 to 3% per year.[25]

5. **Page charges** are used by the publishers of some scientific society serials, particularly in the U.S. A number of societies have reduced or eliminated such charges. Physical Review dropped its page charges from $85 in 1983 to $25, only to raise them to $40 at the end of 1988 in order to relieve some of the price pressure on libraries. Journal of Mathematical Physics and Review of Scientific Instruments have eliminated page charges entirely.[26] The intent of page charges was to make authors (or their institutions or granting agencies) underwrite part of the cost of publication. Understandably, librarians favor page charges, while authors argue that they discourage new (un-funded) researchers from submitting articles, or might bias authors toward journals which do not charge them,

6. **Society versus commercial publishers.** Currently available studies suggest that higher priced journals are generally produced by commercial publishers, while the least expensive come from societies, particularly those charging page charges. (Note that this finding refers to highest price, not highest rate of price increase.) Such

studies are based not on overall subscription price but on costs normalized for the size of the title, in order to exclude the effects of increases in size. At least six studies find societal journals to be a "better buy" than commercial journals. They include:

A. A Crystallography journal study [27] calculated subscription prices per 1,000 printed characters. Among 15 crystallography journals, the three lowest unit-cost titles were society publications which collected page charges, while the four highest were commercially-produced titles with no page charges. The lowest unit cost was .5 cents per 1,000 characters and the highest was 11.8, a range of 23.6 between the least and most expensive. The study was based on 1986 subscription prices and sizes.

B. An American Chemical Society Study [28] compared 76 journals by price per 1,000 words. Only ACS journals were specifically identified; the others were not identified by publisher. However, examining each title showed that the 17 most expensive subscriptions are from commercial publishers; 25 of the highest priced 30 titles are commercially published; only 5 of the least expensive 38 (or half) are from commercial publishers. The highest per unit cost is 100.7 cents; the lowest is .5 cents. It should be noted that this study included very different types of publications, from different market groups. However, the relative locations of commercial and non-commercial publishers in unit prices shows a convincing result. ACS maintains this data on a continuing basis, although distribution is restricted.

C. A physics study [29] examined price per 1,000 characters for 1986. Prices ranged from .39 cents to 31 cents, a factor of 79.5. To assess the "impact" of a journal, the study investigated the average number of citations listed in the 1986 Science Citation Index. It concluded that "All the publishers whose journals have low average costs per character or low ratios of cost to impact are scientific societies or their associations, while the publishers whose journals have high costs per character or high ratios of cost to impact are commercial firms."

D. An Optical Society study [30] examined cost in cents per 1,000 words for 40 optical journals in 1986. The ranked list clearly demonstrated that society or association publications are significantly cheaper than commercial ones. The 20 most expensive serials were all from commercial publishers, except for three society journals, whose unusually high cost can be explained by their being translations of foreign titles. The cheapest 20 titles were all from not-for-profit publishers. The range was from 4.2 cents to 96.4 cents per 1,000 words, a factor of about 23. This study is conducted every two years and is available to librarians and other interested parties.

E. An American Mathematical Society study [31] examined 56 mathematical journals in 1984 for cost in cents per 1,000 characters. The range was from 1 to 14 cents, a factor of 14. Looking up the publisher for each titles showed that the 28 least expensive journals per unit, (fully half) were published by not-for-profit organizations, 11 university presses and 17 societies. Of the remaining 26, 24 were published by the commercial sector. (2 were not calculated.) This study is due to be updated in late 1989.

F. A benchmark study of over 3150 papers in 17 major mineralogy, petrology, and geochemistry journals from 1980-1986 led its author to conclude that societies are selling their journals' contents at 1/3 to 1/20 of the price of commercial journals. The highest priced commercial journal costs only $235 less than the total price of all ten journals published by professional societies. Only commercial journals had prices exceeding $2.50 per article. [32]

> The mineralogical study is a model in its attempt to quantify journal quality by examining bibliometric rankings (as reported by ISI), gathering hard-to-come-by circulation statistics, and determining sources of financial support (funding obtained by the author) for each article. The suggestion was made that this combination of factors could be used to assist with sound cancellation/retention decisions.

In fairness, it must be recognized that many of the commercial publications studied are foreign, so that recent exchange rates have exaggerated the differences. Commercial publishers argue in support of their prices compared to the emerging "information-on-demand" market, in which articles supplied through document delivery services cost at least $10 and more. As one commercial publisher stated: "At $3,626 per year for 1988, the Journal of Chromatography seems expensive. But consider: 63 air-delivered issues per year containing 18,500 pages. Each page costs 20 cents; each article, about $1.80." [33]

It has been suggested that when commercial publishers have acquired contracts to produce journals formerly produced by the not-for-profit sector, the prices have increased dramatically (an analogy might be drawn to privatization of government information). No definitive studies are available to demonstrate this effect. (However, see Appendix 5 for a press release regarding the Wayne State University Press Journal, Human Biology. The subscription price after a commercial takeover was proposed to be several times higher than that being charged by the university press.) Presumably there is some perceived benefit in moving publication to the commercial sector. A society might be relieved of an inconvenient and possibly burdensome responsibility, or rewarded with income to use toward other society purposes.

Studies such as those cited in #6 above may be used to examine the relationship between societal and commercial scholarly serial prices. While the "bottom line" effect (price to libraries) is apparent, the relationships are not as precise as they appear. First there needs to be an absolute measure of the price of a journal, based on a standard unit measure, adjusted for a standard definition of "information" (text, graphics). No agreed standard for calculating serials costs so precisely exists; the ALA Library Materials Price Index Committee work, for example, is based on subscription price per title alone.

Next, there must be a way to measure publishers' income, information which is often closely held. For both commercial and not-for-profit publishers, income includes subscription and advertising revenues. For society or association publishers, it may include page charges, grants, and membership fees. (Societies and association publications generally have a broader subscriber base than commercial journals.) Society expenses include funding various programmes and services. Expenses for both types of publishers include editorial, publication, and distribution costs, and discounts to subscription agents. Overheads are lower for societies, because of their non-profit tax status. However, societies' profits are rechannelled into benefits for the organization and its members, while commercial publishers produce profits for shareholders.

If it were possible to quantify all the costs and income of both types of publishers, one would then attempt a determination of quality. A journal recognized as preeminent, publishing notable research and Nobel Prize laureates, is considered virtually unassailable, essential in its field, regardless of its price. (See a letter by Robert Maxwell to shareholders which reads, "Historically, libraries have been concerned with the quality of the contents of journals, with the price being of lesser importance.") [34]

Both commercial and societal publishers purport to have excellent editors and editorial boards, rigorous refereeing, and high standards. While there is a sense that some journals are "better" than others, most of the quantitative measures employed so far are citation counts, which suffer from their own difficulties. One notable exception to this is the Mineralogical study described above, which utilizes three objective measures.

Although society and other not-for-profit publishers are comparatively cost effective for libraries, they have not characteristically been the innovators of journals to meet emerging needs. (Some would argue that this is in their favor.) They often have not had the capital or the entrepreneurial spirit required for such a launch. Thus, they have not spearheaded the evolution of new disciplines. For researchers in new or interdisciplinary areas, or those not able to pay page charges, society publications have not always offered an option. Nonetheless, **the most cost effective course for the entire research community is to publish by preference in lower price-per-unit journals,** such as those produced by societies.

THE SYSTEMIC ARGUMENT

The systemic argument regards the problem of high subscription costs as not so much a consumer problem but as fault of the "system." The components of the systemic problem are:

I. Sheer Size

There are more academics, scholars, and researchers than ever. There is an explosion of fields of endeavor. Modern technology makes it possible to conduct research more efficiently. At least 40,000 scientific journals, containing more than a million articles, are estimated to appear each year. [35] The National Science Foundation reports that in the decade from 1976 to 1986, the number of U.S. scientists more than doubled to over 4 million. [36]

King Research concluded in a widely quoted study: "The amount of recorded literature doubles about every 15 to 17 years. This means that all the scientific knowledge recorded throughout the history of mankind up to 1970 has doubled since that time and will probably double again by the end of this century." [37]

New technologies facilitate publication, both in mainstream forums and through "electronic mail" and desktop publishing. Technology is revolutionizing the way in which some information is transmitted and held; it creates new "collections" which cannot be pinned down to any one location. Yet these new forms do not replace the demand for conventional materials; there is no reduction in paper publication and the new services complement rather than substitute. Last fall's Society for Scholarly Publishing seminar at Chapel Hill, North Carolina, confirmed again that scholarly publishing is likely to continue, for the most part and for the foreseeable future, in paper form. The majority of participants believed that there are major obstacles to immediate, radical change and that there are few, if any, strong incentives to abandon paper.

II. Competitiveness

In the academic world, competition leads to increased publication. (The same is sometimes true in the commercial world, although at other times it leads to the exact opposite: secrecy.) Competition often insists upon publication in order to secure grants and funding. Being "first" can be important in getting money and promotions.

In addition, the distinction between commercial and non-profit behavior in the research world has become blurred. Significant components of that world, even within universities, are driven in a competitive, highly pressured fashion, resembling "for profit." Universities are aggressively seeking revenues from patents on the research conducted by their members. In 1988, Stanford led this race, with $9.2 million in revenues from its patents. [38] The University of Chicago has initiated a marketing corporation with Argonne Laboratory to exploit their research. [39] (These "profit-oriented" pressures have increased and diversified demands users make on libraries. Although libraries have remained largely untouched by "profit-oriented" behavior, they have suffered many of its results.)

III. The Academic Tenure System

The National Science Foundation reports that 28% of practicing scientists work in academe. [40] Analysis of U.S. authored scientific papers for 1985 has shown that 69.2% of publications come from academe; 9.4% carry federal government addresses; 8.5% carry private industry addresses; 7.4% carry not-for-profit private sector addresses; 3.6% come from FFDRCs, and the rest are assorted. [41] It is likely that some of the papers counted as non-academic originate with academic scientists working in other sectors on grants or on leave. Thus, just over 1/4 of scientists are responsible for about 3/4 of scientific papers. In academe, publication is one of the products of research, while in other sectors it is less critical, unnecessary, or not permitted.

The techniques of judging academic tenure are a significant contributor to the growth of publication. Prior to granting a faculty member full job security and "academic freedom," universities first require evidence of the individual's qualifications, ability, and performance. While evidence is gathered in several ways, the most important objective measure is perceived to be achievement demonstrated via publications in books and journals deemed of good quality. Thus, the academic tenure system may encourage publication in quantity over quality. It is not only in the individual's interest to publish, but also in the interests of the individual's department and institution, to which prestige (and money) accrues.

Recently, the *Chronicle of Higher Education* published an article saying:

> "Today, in the sciences alone, pieces come in to over 40,000 journals at the rate of one every 30 seconds . . . Of course, this may not be such a problem, since evidence indicates that no one reads what other people write. That people are writing for nobody except themselves may account for the curious fact that self-citation of previous work enhances the changes that a new piece will be accepted. We seem to be headed towards a situation where 'knowledge production' (as they like to call it in universities) is an exercise in solipsism. The chief beneficiary is the author, who gets promotions, tenure, prestige, and more grants to write stuff that won't be read. The secondary beneficiaries are institutions and departments whose reputations grow with the knowledge produced." [42]

Some cynics suggest that the pressures to publish as many papers as possible has created a new scientific measure: the Least Publishable Unit or "LPU". [43] Research results are broken down into the smallest possible sets of information that can be delivered as separate articles. The same experiments or studies once reported in a single paper may generate several articles. Everyone connected with a study may be given credit for authorship. (An extreme version of this tendency was a recent article of 4 pages with 190 authors. [44])

Some go so far as to argue that publication does not further research, because researchers exchange critical information in person, in conference proceedings, and via electronic communication. In any case, there is some evidence that the increasing population of journal articles is read by comparatively few people, many of them unable to cope with the sheer volume of the published literature. Library use studies confirm that a high proportion of research materials goes unread. It is at least questionable whether all these materials justify the high prices that libraries must pay.

IV. The Academic Grants System

Statistics collected by the National Institutes of Health show that the U.S. government spends about 5 billion dollars annually on medical research, and that this research generates in excess of 30,000 published articles each year. Approximately 80% of biomedical research is funded directly by the government. [45] National Science Foundation analysis suggests that the government funds a majority of U.S. scientific research, percentages varying by discipline. Private industry funds more applied sciences and engineering than theoretical projects. [46] Corporately funded research, while nominally private, is substantially a reaction to tax policies or the opportunity to "leverage" publicly funded research into areas of special corporate interest. Thus, many if not all privately funded grants can be considered to some extent "publicly funded."

V. Open-endedness of the Information System

In universities, librarians make annual budget requests for materials deemed to be necessary for the library. Librarians are not always specialized enough to assess the quality of materials to be purchased; they also work with faculty, who may lack a broad perspective on the role of the library and focus on their own area of research. The resulting selections may not be altruistic. Librarians have no accurate mechanisms to measure detailed journal use or true "necessity" for the library. (Since journals frequently do not circulate, the only mechanism to measure use is reshelving, a method which does not reveal which or how many specific articles are being read.)

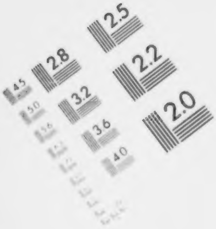
Serials selection mechanisms may be influenced by campus politics and the "squeaky wheel". In turn, administrators making budget appropriations for the entire institution are unlikely to work in the library or be active users of the materials purchased. The regents or legislators who make overall budgeting appropriations are at a still greater remove.

VI. Historic Expectations of Research Libraries

Some librarians believe that their duty is to collect "everything" for the student or researcher who may need it today or someday. This expectation is now referred to as the "warehouse" or "supply" model, in which a library user is surrounded by the universe of knowledge and has merely to select what he wants from the shelves. In particular, the traditional mission of ARL libraries has been to store as much information as possible to meet present and future, local and distant needs.

The selection of monographs for libraries less frequently falls prey to such expectations (in theory) than does journal selection. Books are more likely to be individual purchases. Once a journal subscription is established, it has a spot on the shelves in perpetuity, or at least until an exceptional situation occurs. (Dropping an academic program or needing to save money occasionally dislodges a serial.) As one ARL director argued in 1976, "Journals, in short, are the sacred cows of libraries." [47]

Librarians often try to operate in the leaner 1980s with 1960s collecting expectations. They have pleaded automatically for maintenance of book and periodical budgets, even in the face of institution-wide cutbacks. Unfortunately, such pleas have come when libraries also seek sizeable funding for automation and for access to information not available in traditional paper (and other) formats, further complicating the budget picture. When arguments for increased purchasing, followed by arguments for maintenance of accession rates, have failed, librarians have often decided to continue serials expenditures to the detriment of other materials lines. It simply is easier, from the standpoint of both staff efficiency and campus politics, to not buy books than to cancel an existing subscription. (This behavior overlooks the greater ease with which journal articles can be obtained from external sources than monographs.) Continual struggles over serials prices sap the energy of librarians and can divert attention from other important library concerns.



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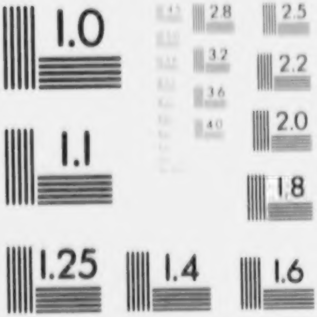

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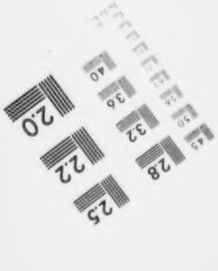

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VII. Historic Expectations of Faculty

Libraries' efforts to maintain the warehouse model and retain as many subscriptions as possible are partially an attempt to fulfill faculty expectations. Many faculty first entered the academic world during the bountiful days of the 1960s, and their expectations of what research libraries can and should provide continue to be high. Tales of faculty irate because of an inability to instantly gratify a "need" for a journal or book are based on many real experiences at reference and information desks.

To some extent, scholars may have a vested interest in the maintenance of high-priced journals, in order to continue their comfortable traditional roles as editors, members of editorial boards, and societies benefiting from journal contracts.

VIII. Librarians as Uninformed Consumers

The systemic argument views librarians as unresisting victims of publishers and suggests that librarians have gotten neither more nor less than they deserve. While this is partially true, there has been a major change in recent years, as librarians have struggled with the impact of serials price increases and the growth of scholarly information.

IX. Role of Journal Publishers

Scholarly journals were originally created by academics, scholars, and researchers, and their professional organizations, the scientific societies. Commercial publishers have now assumed a commanding position in the academic serials arena. This development reflects the strong demand for additional outlets, both for societies' overflow and for new and emerging areas. The demand for publication outstripped the ability (or willingness) of largely conservative, non-profit organizations to fill it. Commercial publishers have been especially quick to perceive the expanding market for publication of science research, due to the huge funding poured into such research, and the potential for some direct economic applications.

By definition, commercial publishers must place profit before any notion of a larger community benefit. They have also observed that libraries are reluctant to cancel journals or series (and have even created pseudo-serials to attract library subscribers), and that libraries are prepared to pay prices enormous compared with those an individual would find reasonable. The collective library purse is perceived as almost bottomless, and some publishers appear to price accordingly. The subscription is paid in advance, well ahead of publication of any, let alone all, issues. Many publishers argue that scholarly publishing is not a highly lucrative industry. On the other hand, Pergamon reported approximately 12 million pounds sterling profit on 40 million pounds turnover in 1984. [48]

The conventional system of serials publishing has demonstrated tremendous adaptability and flexibility in coping with ever-increasing numbers of papers and publications, in expanding existing journals, creating new titles, and exploring new technologies. However, mounting backlogs of papers and unaffordability are evidence of serious problems. Journal articles, which were originally established as a quick dissemination method, may be as slow to appear as a book.

Solutions to the systemic problem require modifications in the "system". This includes the academic reward system, the library behavior and expectation system, and in publisher consciousness, if not at times publisher ethics.

THE ECONOMIC ARGUMENT

A classical economic analysis of high serials subscription prices proceeds as follows:

1. Serials production (supply) requires very high fixed (setup) costs, but has low marginal (additional) unit production costs.

2. The market (demand) for scholarly journals is quite limited.

3. Library acquisition (demand) has low "elasticity." That is, it does not change rapidly as price changes. (A common example of such low elasticity is the demand for food -- one can neither eat much less nor much more. The demand for some products even has negative elasticity. For example, if the price of all foods goes up, the demand for cheaper foods such as macaroni may increase.)

4. As long as serials are sold at a single price, the intersection of these supply and demand curves occurs at a very low quantity and high price. This unfortunate situation occurs although the economy as a whole would receive a greater "total benefit" if the serial were produced and sold at an "economic price" equal to the marginal production cost. The difficulty is that a special (non-market) mechanism is needed to achieve this "economic price," and the re-distribution of the resulting extra "total benefit" causes contention. Economists call such a market a "natural monopoly." (One solution proposed in such situations is the use of a government academic publishing subsidy or agent to realize and distribute the otherwise unrealized benefit. An example of such a subsidy system in a natural monopoly is the Post Office.)

5. In the absence of a "common good" mechanism, publishers have pursued a policy of multiple-tier pricing to gain for themselves some of the otherwise lost economic benefit. This is possible only because of publishers' ability to subdivide the market, largely due to libraries' acceptance of multiple-tier pricing. (An analogy can be drawn with airline ticket prices. Businessmen are willing to pay a higher price for flexibility than tourists, to whom flexibility does not matter.) Libraries accept a higher institutional price as "fair." They insist of receiving subscriptions directly, rather than avoiding such special prices and accepting any complications or delays. They do not wish to buy articles out of the journal on a demand basis, but rather collect the subscription in its entirety.

Although dual pricing clearly benefits the publisher, it can also benefit the purchaser, at least one who pays the lower price. An example is the case of a society which wishes to minimize the cost to its members by covering all its costs through library subscriptions and selling the serial to members at less than its production cost.

6. In a marketplace in which a publisher holds a "natural monopoly," wasteful behavior by the publisher, such as economically unproductive growth in the size of the serial, can occur without correction, particularly with the unwitting cooperation of editors and scholars.

7. What can be done, short of the institution of a "common good" academic publishing subsidy mechanism? Several approaches are possible: (1) making wise purchasing decisions; (2) achieving, within each institution, the highest possible usage of the materials for which one has paid; and (3) attempting to change the unacceptable components of the system as proposed later in this report.

8. Does technology change the economic argument? In principle, not a great deal, because the shape of the supply and demand curves does not change substantially. However, it makes the subsequent distribution of the purchased information within the institution a great deal easier. Technology also introduces new problems, demands, and expenses. In this context, it is useful to consider the International Crystallographic Union's

continuing efforts to use technology to reduce the production costs of their publications by such means as accepting "compuscripts," and some of the associated problems. [49]

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CHAPTER 4 - SUMMARY AND RECOMMENDATIONS

But there should be some legal restraint aimed against inept and useless writers as there is against vagabonds and idlers. Montaigne, 1588

Research libraries face a crisis in their ability to purchase, store and distribute the results of research. The principal mechanism for rapidly reporting results is through serials. Over the last decade, the price, size, and number of serials have risen dramatically, and the trend will probably continue. Libraries confront a dilemma: they must either curtail their serials collections or restrict other non-serials purchases. Research libraries are currently cutting both serial and monographic purchases to stay within their budgets. These steps are occurring in spite of diligent library efforts to limit the growth of serials subscriptions, develop co-operative collections, and share resources. In view of the extended time scale over which research libraries must plan, the current situation is a serious crisis.

These conclusions are based on the following observations:

1. The proportion of ARL libraries' materials budgets devoted to serials expenditures is increasing at a rate which threatens to consume the entire budget within a period short in comparison with library time horizons.

2. ARL libraries' serials holdings have ceased growing and actually decreased over the last three years.

3. The proportion of the "serials universe" held by ARL libraries is decreasing markedly.

This problem has not appeared suddenly; its symptoms have been evident for several years, but are now acute. ARL libraries have already implemented cancellation programs, including both multiple copies and journals not demonstrably critical to their institutions' educational and research needs. For many ARL libraries, earlier rounds of cancellation have been difficult; the next will be painful and seriously affect service to the research community. Ultimately, the real victims of this crisis are scholars who need timely access to published information, students learning from previous research, and the academic community which, by definition, relies on research libraries for access to the archive of human knowledge.

The principal causes of the serials crisis are:

1. The explosion in the number of serials titles.

2. The increasing size and/or frequency of many serial titles.

3. The particular concentration of these increases in the most expensive fields, particularly sciences. Serials in these areas have historically been substantially more expensive than in other disciplines. Their average rate of price increase is also higher than that of other areas, exacerbating the problem over time. (Scientific research is increasingly complex and expensive; it consumes tremendous financial resources. This allocation of resources is frequently driven by the anticipation of significant economic benefits.)

4. The key role of commercial, profit-seeking publishers, especially the "international" publishers, in the production of these serials. Again, this characteristic particularly (although not exclusively) affects scientific fields.

5. Foreign serials prices are uniquely subject to fluctuations in exchange rates and to the recent practice for some publishers to use differential regional prices. These effects have been particularly unfavorable to North American libraries during periods of currency downswings over the last decade. In major libraries with collections concentrated in sciences, these problems are even more dramatic, because European research and publishing in sciences have historically been of vital importance for the academic community.

RECOMMENDATIONS

The possible solutions for the current crisis are implicit in these causes. This report proposes three major recommendations. The first comprises specific, discrete actions to be undertaken immediately among the member libraries. The second and third involve major systemic modifications of the existing system of scholarly publishing. Specific actions are defined to initiate each of these recommendations.

Immediate Actions

RECOMMENDATION 1 ARL should undertake a set of urgent actions to demonstrate the serious and immediate impact of the serials crisis. ARL should appoint a staff officer to actively lead its efforts with the university, government, and publishing communities.

The seriousness of the serials problem does not permit the luxury of waiting for an over-arching universal solution. Libraries must pursue specific limited goals more substantial than the simple continuation of serials cancellations programs. They must seek to improve both the prices they pay for their serials and the value they gain from them. Libraries must behave as sophisticated consumers buying a very expensive product. (For example, an excellent consumer position has been documented from the University of Michigan Libraries. [1])

ARL should act as a central coordinator for work being done in this area; it should commission new research in specific critical areas. It should create and distribute a "Serials Consumer Report" informing the library and larger academic community of its findings and recommendations. Specific programs which can have immediate application in understanding and curing the serials crisis include:

1. Research. The current study should be augmented to improve understanding, for instance, different types of publishers and serials, of the relation between serials prices, citations, impact, and quality; to examine non-sciences journals costs, and to consider alternative technologies (online, CD-ROM, advanced paper).

2. Indexes. The development of publisher and subject-specific cost indexes for critical serials titles must be pursued immediately. Standards for cost per unit must be developed. A mechanism of creating, maintaining, and distributing such indexes must be established.

3. Education and Publicity. Librarians, faculty members, administrators, societies, umbrella organizations, and politicians must become vitally and continually aware of the serials problem. For instance, updated briefing packages should be sent to the ARL membership. Presence at appropriate meetings and program presentations to related educational, scholarly, and publishing organizations must be pursued.

4. Protest. The research library community should consider carefully targeted cooperative actions to forcefully alert publishers to the seriousness with which it regards the situation. One such program is being pursued by the University of Alberta Libraries on behalf of 52 Canadian libraries. Over 20,000 subscriptions representing about 2,000 titles from 8 of the most expensive STM publishers have been identified and publishers have been asked to negotiate price. [2] This is as much a political as an economic statement.

5. Sharing. Although resource-sharing might offer relief from the serials crisis, libraries must explore further why present mechanisms frequently fail, why they are so expensive (inefficient), how libraries might improve inter-library loan speed and cost, and how it would be possible to establish effective co-operative national or regional acquisitions/storage/delivery programs. Related questions of trade restraint and copyright need to be explored further.

6. Collection development. Research libraries, in conjunction with research faculty, must establish regular reviews of critical expensive serials, and share such reviews. Such assessments of serial quality and value for price will assist in planning cancellations or additions.

7. Use. Libraries need to better understand which journals are used, and how heavily, down to the article level. Such understanding has recently become feasible, particularly where journal citations are available through an online catalog.

8. Internal marketing. To achieve full benefit for dollars spent, libraries must ensure that the library serials collection achieves the largest possible use. Such methods as faculty profiles, tables of contents, and document delivery need to be refined. Libraries ought to consider providing access to journal citations through local catalogs to encourage researchers to use the entire serials collection.

9. Role of research libraries. The serials crisis seriously challenges the traditional role of the research library. Research libraries, both individually and collectively within ARL, need to carefully reconsider the extent to which they provide satisfactory access to resources as opposed to a locally owned and administered archive.

The Role of Commercial Publishers

RECOMMENDATION 2 ARL should strongly advocate the transfer of publication of research results from serials produced by commercial publishers to existing non-commercial channels. ARL should specifically encourage the creation of innovative non-profit alternatives to traditional commercial publishers.

It is no longer affordable for the product of publicly funded research to be published heavily through private commercial channels. Non-commercial publishers are a logical complement to a system which begins with public funding of research, continues through the conduct of that research at largely public or publicly supported institutions, and finally stores and accesses the results through publicly funded libraries. It is anomalous that a large proportion of research results should be purchased from commercial channels. **In view of the public funding of the research reported, non-commercial channels might very well be designated as the first choice of publication for reporting of publicly funded research.**

The for-profit publisher is driven by market forces not necessarily in the interest of research libraries or the broader public good. Commercial publishers have every incentive to increase the number, size, and price of their journals. They will solicit and publish as many papers as possible, at as high a price as their market will permit. Many of the serials collected by research libraries are classical "natural monopolies". Commercial publishers clearly contribute a very important element of innovation. If, through their efficiency, they were able to publish research at a lower total cost to society, private publication of public research would be reasonable. However, at present, **the distribution of a substantial portion of academic research results through commercial publishers at prices several times those charged by the not-for-profit sector is at the heart of the serials crisis.**

It would be premature to advocate the overthrow of the journal publishing system and to replace it with electronic means. Such a replacement might become feasible as technology and equipment become more pervasive, and more importantly, as standards and mechanisms evolve. A serials publication system which simply collects all research results into an enormous "research database" would not by itself be adequate, even if it were virtually free. An excellent outline of the problems in creating a viable electronic journal and document replacement system has been described by Carnegie Mellon University in a proposal for its Project Mercury. [3] Such a prototype is not yet implemented.

Publication, particularly in journal format, provides services to both the researcher and the research community far beyond simple dissemination. It provides refereeing (quality judgments), editing, indexing, gathering like with like (into journals serving the same fields), appropriate packaging, and distribution. In addition, a secondary industry which indexes and abstracts articles has grown up around serial publishing to provide even better access to these materials. Authors and libraries depend on all of these services to achieve effective distribution of research.

To satisfy scholars and writers' needs, an article publishing mechanism must possess the following attributes:

1. Provide all of the functions now performed by serials publishers.

2. Be regarded by authors and libraries as capable of successfully competing with existing serials publishers, both in business and academic terms.

3. Deliver equivalent services at an acceptable (lower) price.

4. Achieve a speed of publication compatible with the rapid progress of modern research.

Satisfactory, affordable channels for traditional serials publication already exist. For example, there are reasonably priced commercial serials publishers. Many of the non-profit learned societies are already substantial publishers. University presses could substantially expand their role in serials publishing. (With the exception of the University of Chicago press, most university presses have small serials publishing programmes concentrated principally in the non-sciences.) The serials currently produced by these organizations are significantly less expensive than those from the commercial publishers, even though they may increase in price at similar rates. Several analyses of the "impact" of serials, in terms of the readership achieved per dollar, show that those produced by non-commercial sources have a higher impact than commercial titles. Both society publishers and university presses already possess publishing mechanisms and expertise. The problems of "gearing up" for expanded publication, although not trivial, may be more problems of will and of encouragement than of means.

The idea of a new alternative to commercial publishing does not imply a single, national publisher. Any new serials publisher does need to be well organized, operated, and financed, as well as smart, aggressive, and with the strength to overcome authors' inertia and deal with existing competition. While any new alternative needs to be as "professional" as present serial publication, it need not be as elegant, for example, in artistic layout or paper weight.

New non-commercial publishing channels might be enterprises created through a combination of enthusiasm and legislation. Such new enterprises might be a consortium of universities engaged in publicly-funded research, a consortium of learned societies, or a broad-based not-for-profit organization already moving into publishing, such as OCLC. Government organizations such as NSF and NIH might be logical publishers of their own research, but would cause concerns over government control and the free flow of information. Not-for-profit library groups such as the National libraries do not currently have substantial publishing interests or expertise, but might assume some supporting function.

One interesting proposal was made by the New York State Library to create an alternative scholarly publishing system modelled largely after the public broadcasting system. In this suggestion, an agency is created by libraries to be the locus of non-profit scholarly publishing. The PBS prototype was chosen because of its networking relationships across the country. [4]

The development and expansion of serials publishing channels is not constrained to any specific publishing technology. Considering the current rapid development of new publishing technologies, emerging publishers might pursue innovative techniques, including the use of advanced paper publishing methods, on-line serials, or optical disk publishing. In fact, an important advantage of a new entity is that it does not have a large capital investment in old technology and may be able to leapfrog those organizations already committed to existing methods.

ARL should undertake the following specific actions to implement this recommendation:

1. ARL should publish and distribute its conclusion and arguments for the rapid transfer of research results from commercial publications to non-commercial channels, in order to reach the greatest possible audience.

2. ARL should convene a group of leading learned society publishers, university presses, and potential credible non-commercial publishers to present its conclusion, with the intent of convincing these institutions to undertake the required expansion of their publication.

3. ARL should convene a group of university and granting agency representatives to explore the feasibility of making publication through a non-commercial channel the preferred means for reporting the results of publicly funded research.

4. ARL should present its position to the House and Senate committees specifically involved in the funding of Federal granting agencies, including testimony at appropriate hearings, with the intent of modifying the actions of the granting agencies as suggested.

5. If a credible alternative non-commercial publisher would require initial or continuing funding, ARL should support applications for such funding, including support to proposals to funding agencies and testimony before the appropriate House and Senate committees.

The Quantity of Academic Publication

RECOMMENDATION 3 ARL should strongly advocate that University administrations and granting agencies change their policies for judging promotion, tenure, and funding, so as to minimize current pressures for excessive publication. ARL should monitor the implementation of such changes and report the extent to which Universities and funding agencies participate.

A dramatic change in the method of judging academic performance through publication, implemented by a substantial number of leading colleges, universities, and granting agencies, is necessary immediately. Publication is of central importance in the distribution of research results, and the academic community must avoid impeding the flow of genuinely new results. However, **a great deal of the publishing explosion appears attributable to the current method of judging academic success (promotion, tenure, and grant-getting) by publication.**

Current practices generate strong incentives to publish extensively. Even given the best intentions of authors, editors, and publishers, it is reasonable that some portion of the rapid growth in publication is due to these pressures. An earlier section discussed the huge quantity of articles being produced, largely by academic scholars. Some academic organizations, such as Harvard Medical School and the National Institutes of Health,[5,6] have already proposed that tenure and promotion assessments be made on the basis of a limited number of the best articles published by a candidate rather than his entire bibliography.

It is not currently possible to measure the extent of excessive publication. The academic community itself must recognize the need to reduce the worst excesses (repeating the same research in different articles or fragmenting research reports so as to create many articles where a few would suffice). In the end, it is that community which will suffer most if the problem is not addressed, through the difficulty of finding real results among the chaff, and through the library cancellations which must otherwise occur. At the same time, it is important not to stifle or discourage publication. Without the ability to publish innovative work, we would live in a poorer world.

ARL should undertake the following specific actions to implement this recommendation:

1. ARL should publish and distribute its conclusion and arguments regarding the need to reform the technique for judging academic promotion and grants so as to eliminate pressure for excessive publication, in order to reach the greatest possible audience.

2. ARL should convene a group of leading university presidents and representatives of granting agencies to alert them to the serious impact of current peer review practices on library budgets, collections, and mission, with the intent of influencing change in present practices.

3. ARL should present its position to the House and Senate committees specifically involved in the funding of Federal granting agencies, including testimony at appropriate hearings, with the intent of modifying the actions of the granting agencies as suggested.

This report establishes the reality of the serials crisis. The problem is complex, and the solutions are not simple. It is time for the library community to seriously begin. The mutual goals of libraries, scholars, and societies need to be clarified and methods developed to ensure communication of information at costs which the academic community and libraries can afford. These recommendations are realistic proposals for such a beginning.

FOOTNOTES

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(3) Conversations and correspondence with Thomas Michalak, Director of University Libraries, 3/89.

(4) Jerome Yavarkovsky, Director, New York State Library, in a letter dated April 13, 1988, to Congressional Research Service.

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Appendix 1

ARL Statistics

1 YEAR	2 LIBRARY	3 TOTAL	4 CHANGE	5 TERM	6 MEDIAN	7 CHANGE	8 MEAN	9 CHANGE	10 TERM	11 BUDGET1	12 CHANGE	13 TERM	14 MEABUD1	15 CHANGE	16 TERM	17 BUDGET2
1971/72	78	1659909		77.7	17160		21281		29.6	$76,009,003		419.1	$974,474		278.4	
1972/73	81	1865372	12.4		17352	1.1	23029	8.2		$86,329,129	13.6		$1,065,792	9.4		
1973/74	82	2143440	14.9		19343	11.5	26140	13.5		$94,542,693	9.5		$1,152,960	8.2		
1974/75	88	2205951	2.9		18758	-3.0	25068	-4.1		$106,666,093	12.8		$1,212,115	5.1		
1975/76	94	2362260	7.1		18876	0.6	25130	0.3		$125,949,270	18.1		$1,339,886	10.5		$50,884,028
1976/77	94	2344217	-0.8		18511	-1.9	24938	-0.8		$132,916,809	5.5		$1,414,009	5.5		$58,767,742
1977/78	94	2425880	3.5		19146	3.4	25807	3.5		$147,150,732	10.7		$1,565,433	10.7		$69,245,386
1978/79	98	2475038	2.0		18909	-1.2	25255	-2.1		$169,822,532	15.4		$1,732,883	10.7		$84,073,715
1979/80	99	2557574	3.3		19568	3.5	25834	2.3		$181,744,249	7.0		$1,835,800	5.9		$92,577,978
1980/81	101	2666527	4.3		19378	-1.0	26401	2.2		$204,568,291	12.6		$2,025,429	10.3		$109,832,813
1981/82	101	2708409	1.6		20054	3.5	26816	1.6		$224,015,108	9.5		$2,217,971	9.5		$117,046,121
1982/83	104	2781654	2.7		19943	-0.6	26747	-0.3		$251,645,994	12.3		$2,419,673	9.1		$130,225,878
1983/84	105	2855490	2.7		20237	1.5	27195	1.7		$272,245,325	8.2		$2,592,813	7.2		$138,057,103
1984/85	106	2938878	2.9		20998	3.8	27725	1.9		$298,706,065	9.7		$2,817,982	8.7		$153,359,601
1985/86	106	2918220	-0.7		20537	-2.2	27530	-0.7		$330,545,622	10.7		$3,118,355	10.7		$165,322,209
1986/87	106	2914429	-0.1		20959	2.1	27495	-0.1		$359,638,171	8.8		$3,392,813	8.8		$195,307,559
1987/88	107	2950051	1.2		20871	-0.4	27571	0.3		$394,539,591	9.7		$3,687,286	8.7		$221,780,566

YEAR	18 CHANGE	19 MEABUD2	20 CHANGE	21 BUDG2/1	22 BUDGET3	23 CHANGE	24 TERM	25 MEABUD3	26 CHANGE	27 TERM	28 MEAB1/MEAB3	29 AIA	30 CPI	31 CHANGE	32 TERM
1971/72					$260,515,355		358.2	$3,339,940		234.0	29.2	13	50.8		182.5
1972/73					$291,063,295	11.7		$3,593,374	7.6		29.7	22	54.0	6.3	
1973/74					$318,451,889	9.4		$3,883,560	8.1		29.7	9	59.8	10.7	
1974/75					$364,111,322	14.3		$4,137,629	6.5		29.3	12.5	65.3	9.2	
1975/76		$541,319		40.4	$415,772,233	14.2		$4,423,109	6.9		30.3	12.9	69.1	5.8	
1976/77	15.5	$625,189	15.5	44.2	$445,707,987	7.2		$4,741,574	7.2		29.8	9.2	73.6	6.5	
1977/78	17.8	$736,653	17.8	47.1	$483,776,253	8.5		$5,146,556	8.5		30.4	12.2	79.2	7.6	
1978/79	21.4	$857,895	16.5	49.5	$545,715,124	12.8		$5,568,522	8.2		31.1	10.1	88.1	11.2	
1979/80	10.1	$935,131	9.0	50.9	$581,587,134	6.6		$5,874,618	5.5		31.2	13.7	100.0	13.5	
1980/81	18.6	$1,087,454	16.3	53.7	$652,783,379	12.2		$6,463,202	10.0		31.3	13.3	110.4	10.4	
1981/82	6.6	$1,158,872	6.6	52.2	$720,280,020	10.3		$7,131,485	10.3		31.1	14.5	117.1	6.1	
1982/83	11.3	$1,252,172	8.1	51.7	$790,277,782	9.7		$7,598,825	6.6		31.8	12.1	120.9	3.2	
1983/84	6.0	$1,314,830	5.0	50.7	$857,836,649	8.5		$8,169,873	7.5		31.7	9.4	126.1	4.3	
1984/85	11.1	$1,446,789	10.0	51.3	$945,890,823	10.3		$8,923,498	9.2		31.6	8.6	130.5	3.5	
1985/86	7.8	$1,559,643	7.8	50.0	$1,027,621,436	8.6		$9,694,542	8.6		32.2	8.9	133.1	2.0	
1986/87	18.1	$1,842,524	18.1	54.3	$1,106,251,359	7.7		$10,436,334	7.7		32.5	9.9	138.0	3.7	
1987/88	13.6	$2,072,716	12.5	56.2	$1,193,562,457	7.9		$11,154,789	6.9		33.1	9.1	143.5	4.0	

	33	34	35	36
YEAR	INFLATION	SERIAL-INFL	MEASER$	CHANGE
1971/72	$3,339,940			
1972/73	$3,550,330			
1973/74	$3,931,662			
1974/75	$4,293,269			
1975/76	$4,543,107	$4,423,109	$21.54	
1976/77	$4,838,968	$5,108,403	$25.07	16.38
1977/78	$5,207,151	$6,019,175	$28.54	13.86
1978/79	$5,792,298	$7,308,132	$33.97	19.00
1979/80	$6,574,685	$8,047,368	$36.20	6.56
1980/81	$7,258,452	$9,547,249	$41.19	13.79
1981/82	$7,698,956	$10,174,268	$43.22	4.92
1982/83	$7,948,794	$11,319,922	$46.82	8.33
1983/84	$8,290,678	$12,000,654	$48.35	3.27
1984/85	$8,579,964	$13,330,828	$52.18	7.93
1985/86	$8,750,906	$14,370,681	$56.65	8.56
1986/87	$9,073,065	$16,977,167	$67.01	18.29
1987/88	$9,434,673	$19,278,340	$75.18	12.18

Appendix 1

Column Labels for ARL Statistics

1 Year of ARL statistics.

2 Number of university libraries reporting. Note that non-university libraries are excluded from these summaries.

3 Total number of current serials held in reporting libraries.

4 Percentage change in (3) over previous year.

5 Percentage change in (3) over the entire term.

6 Median number of current serials held in reporting libraries.

7 Percentage change in (6) over previous year.

8 Mean number of current serials held in reporting libraries.

9 Percentage change in (8) over previous year.

10 Percentage change in (8) over the entire term.

11 Total materials budgets expended in reporting libraries.

12 Percentage change in (11) over previous year.

13 Percentage change in (11) over the entire term.

14 Mean total materials budget expended in reporting libraries.

15 Percentage change in (14) over previous year.

16 Percentage change in (14) over the entire term.

17 Total current periodicals budget expended in reporting libraries.

18 Percentage change in (17) over previous year.

19 Mean total current periodicals budget expended in reporting libraries.

20 Percentage change in (19) over previous year.

21 Total current periodicals budget expended as a percentage of total materials budget expended.

22 Total expenditures for ARL university libraries.

23 Percentage change in (22) over previous year..

24 Percentage change in (22) over the entire term.

25 Mean total expenditures for ARL university libraries.

26 Percentage change in (25) over previous year.

27 Percentage change in (25) over the entire term.

28 Mean materials expenditures as a percentage of mean total library expenditures

29 ALA/LMPIC periodical subscription index, domestic periodicals.
(Note that ARL stats span mid-years, i.e., 1971/72. ALA index is given for the 2nd of each of those years.)

30 U.S. Consumer Price Index, from International Monetary Fund statistics. (Note that ARL stats span mid-years, i.e., 1971/72. CPI is given for the 2nd of each of those years.)

31 Percentage change in (30) over previous year.

32 Percentage change in (30) over the entire term.

33 ARL university library expenditures, if they had grown at precisely CPI rate.

34 Total ARL university library expenditures which would have been necessary to hold serials expenditures at the same proportion as 1975/76.

35 Average price per current periodical, i.e., (17) divided by (3).

36 Percentage change in (35) over previous year.

Appendix 2

Data from LMPIC

	1972	1988	GROWTH	RATIO (88)	RATIO (72)
U.S. OVERALL	$13.23	$77.93	5.89	1.00	1.00
U.S. INCLUDING SOVIET	$13.23	$105.45	7.97	1.35	1.00
AGRICULTURE	$6.35	$33.56	5.29	0.43	0.48
BUSINESS AND ECONOMICS	$9.95	$53.89	5.42	0.69	0.75
CHEMISTRY AND PHYSICS	$45.46	$329.99	7.26	4.23	3.44
CHILDRENS	$3.24	$16.39	5.06	0.21	0.24
EDUCATION	$9.51	$47.95	5.04	0.62	0.72
ENGINEERING	$16.04	$114.83	7.16	1.47	1.21
FINE AND APPLIED ARTS	$8.42	$32.43	3.85	0.42	0.64
GENERAL	$9.62	$28.29	2.94	0.36	0.73
HISTORY	$8.25	$30.16	3.66	0.39	0.62
HOME ECONOMICS	$10.25	$54.73	5.34	0.70	0.77
INDUSTRIAL ARTS	$8.98	$44.20	4.92	0.57	0.68
JOURNALISM	$8.68	$53.39	6.15	0.69	0.66
LABOR AND INDUSTRIAL RELATIONS	$3.92	$44.06	11.24	0.57	0.30
LAW	$11.15	$43.33	3.89	0.56	0.84
LIBRARY SCIENCE	$9.40	$51.61	5.49	0.66	0.71
LITERATURE AND LANGUAGE	$7.45	$28.04	3.76	0.36	0.56
MATHEMATICS, ETC.	$22.63	$159.33	7.04	2.04	1.71
MEDICINE	$29.59	$180.67	6.11	2.32	2.24
PHILOSOPHY AND RELIGION	$7.16	$27.09	3.78	0.35	0.54
PHYSICAL EDUCATION	$9.39	$28.60	3.05	0.37	0.71
POLITICAL SCIENCE	$8.47	$41.55	4.91	0.53	0.64
PSYCHOLOGY	$20.98	$100.57	4.79	1.29	1.59
SOCIOLOGY AND ANTHROPOLOGY	$9.12	$64.27	7.05	0.82	0.69
SOVIET TRANSLATIONS		$592.22	ERR	7.60	0.00
ZOOLOGY	$22.39	$127.33	5.69	1.63	1.69

Appendix 3

RESOURCES AND TECHNICAL SERVICES DIVISION
A DIVISION OF THE
AMERICAN LIBRARY ASSOCIATION
50 EAST HURON STREET · CHICAGO, ILLINOIS 60611 · (312) 944-6780

Resolution on the price differential of U.S. and U.K. periodical prices. Proposed by the Bookdealer Library Relations Committee (RS) and passed by the Board of the Resources Section June 26, 1984.

Whereas, Libraries subscribing to some British periodicals are required to pay a U.S. subscription price which is significantly higher than the subscription rate charged to libraries within the United Kingdom as well as other overseas libraries, and

Whereas it is expected that there may be some price differential due to fluctuations in exchange rates and postage costs, some British journal publishers have established U.S. prices in excess of what can be considered a normal differential, and

Whereas the higher U.S. price is seriously affecting library budgets and their ability to continue to subscribe to needed British journals, and

Whereas such practices are operating against the free flow of exchanging and disseminating information,

Be It Resolved, Therefore, that the Board of Directors of RTSD request that the Executive Director of the American Library Association take action, in conjunction with other appropriate library organizations, including ARL, SLA, MLA, and IFLA, to convey to British periodical publishers the concern of U.S. libraries and to ask that British periodical publishers establish more equitable subscription rates for U.S. libraries.

Appendix 4

RESOURCES AND TECHNICAL SERVICES DIVISION
A DIVISION OF THE
AMERICAN LIBRARY ASSOCIATION
50 EAST HURON STREET · CHICAGO, ILLINOIS 60611 · (312) 944-6780

87.49

Gail Kennedy
Hyatt Regency
Union Square

RESOLUTION TITLE: Impact of Dollar Devaluation

BODY OF THE RESOLUTION:

Whereas, Library collections, the front line of America's information system, are uniquely vulnerable to the devaluation of the dollar on the international market; and

Whereas, The national policy promoting the economic benefits of the cheaper dollar has ignored the damage being done by devaluation to library collections of all sizes; and

Whereas, Many libraries now find themselves with much of their acquisitions funds committed to pay for existing journal subscriptions, and with no means to pay for increases predicted in the 25% to 30% range for international titles in 1988; and

Whereas, 1987 journal purchases were obten supported by curtailing book buying early in the fiscal year, by halving book budgets, or by taking other extreme measures that cannot be sustained; and,

Whereas, English language books supporting traditional subject areas which are marketed through standard U. S. book trade channels have also been subject to price increases well above normal "inflation" rates, for example English language books from German presses cost as much as 50% more in 1986/87 than they did in 1984/85; now, therefore, be it

Resolved, That the American Library Association make a concerted effort to focus national attention on the impact of dollar devaluation on library collections, the impact on the international flow of information, and the threat that devaluation poses to the nation's ability to educate its youth, conduct its research, and inform its citizenry.

SPONSORS OF THE RESOLUTION: Resources and Technical Services Division

INDICATION OF NATURE OF CONTENT: Non-Policy

PRIOR HISTORY OF THE RESOLUTION, IF ANY: None

RESOLUTIONS COMMITTEE STAMP:

DATE: June 29, 1987

Appendix 5

News From
WAYNE STATE
UNIVERSITY PRESS

The Leonard N. Simons Building
5959 Woodward Avenue
Detroit, Michigan 48202

(313) 577-4603

Wayne
Wayne State University

FOR IMMEDIATE RELEASE FEBRUARY 20, 1989

UNFRIENDLY TAKEOVER ATTEMPTED

Unfriendly takeovers are not a new story. Of late, however, the target is the scholarly journal issued by the nonprofit publisher, most often, a university press. Typically, the journal is underpriced when compared to similar publications by commercial houses. The potential income from increased subscription rates makes these journals attractive takeover candidates for large publishers.

Over the last few years, Wayne State University Press has fought off several attempts to takeover Human Biology, which the Press has published for thirty-five years. Science-related journals issued by commerical presses often command high subscription rates. Wayne State University Press charges institutions a modest $80.00 per year; the commerical publisher expected to increase the rate to $300.00 within three years.

With the full support of Wayne State University, the Press administrators, Robert A. Mandel and Alice M. Nigoghosian, fought the attempted takeover. They viewed the actions of the commercial publisher not only as a threat to Human Biology, but ultimately to other journals published by university presses as well.

Libraries, of course, bear the cost in increased rates. In recent years, librarians have witnessed skyrocketing rates for serials and they have found themselves making painful choices about renewals. They have been forced to cancel subscriptions to exorbitantly priced publications. The ultimate losers in this financial crunch are researchers, scholars, faculty and students.

Resolved to do what was necessary to save Human Biology, Mandel and Nigoghosian have worked almost a year to fend off the imminent threat. Devoting long hours to develop their strategies, they compiled data and projections to insure the viability of the journal at Wayne State University Press. They even prepared documentation in the event that a legal suit might occur. Their efforts met with success--the commerical publisher retreated, deciding to begin a competing journal.

For further information, contact Alice Nigoghosian, Associate Director, Wayne State University Press, (313) 577-6130.